CITY AND COUNTY OF SAN FRANCISCO

PUBLIC UTILITIES COMMISSION

ANNUAL REPORT

OF THE

HETCH HETCHY WATER SUPPLY, POWER AND UTILITIES ENGINEERING BUREAU

AND THE

BUREAU OF LIGHT, HEAT AND POWER

FISCAL YEAR 1958-1959

H. E. LLOYD
MANAGER AND CHIEF ENGINEER

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I. INTRODUCTION

The Hetch Hetchy Water Supply, Power and Utilities Engineering Bureau and the Bureau of Light, Heat and Power are bureaus of the Public Utilities Commission of the City and County of San Francisco. During the fiscal year ending June 30, 1959, the functions of these bureaus were consolidated under one Manager and Chief Engineer. Accordingly, this report covers the joint activities of the two bureaus for the fiscal year 1958-59.

At its meeting held July 8, 1958, the Public Utilities Commission by Resolution No. 18,321, appointed Mr. H. E. Lloyd, Manager and Chief Engineer, Hetch Hetchy Water Supply, Power and Utilities Engineering Bureau, as Acting Manager and Chief Engineer of the Bureau of Light, Heat and Power. Subsequently, at its meeting of February 10, 1959, the Commission, by Resolution No. 18,927, abolished the position of Manager and Chief Engineer of the latter bureau and in addition, by Resolution No. 18,928, directed "that the supervision, direction, management, operation and maintenance of the Bureau of Light, Heat and Power, be assigned to the Manager and Chief Engineer of the Hetch Hetchy Water Supply, Power and Utilities Engineering Bureau".

The Hetch Hetchy Water Supply, Power and Utilities Engineering Bureau combines the functions of an operating department with those of an engineering bureau serving other operating departments of the Public Utilities Commission. In the first capacity, it has full charge of the Hetch Hetchy water supply and electric power system, being responsible for its administration, planning, engineering, construction, operation and maintenance. In the second capacity, it performs engineering work for the Airport Department and the Municipal Railway, including planning and supervising all new construction for those utilities, and providing engineering service in connection with maintenance and reconstruction of the existing facilities.

The Bureau of Light, Heat and Power combines the functions of a service bureau to provide for furnishing utility services for municipal purposes, with those of an operating bureau to provide for the lighting of public ways. In the first capacity, it is responsible for arranging, under contracts, for the furnishing of electric, gas and steam services to municipal departments, and for supervising the performance and checking monthly billing under such contracts. In the second capacity, the Bureau has jurisdiction over the general planning and improvements, and has supervision of the operation and maintenance under contractural arrangements, of the street lighting facilities within the City and County of San Francisco. Prior to this fiscal year the design and construction of a portion of City-owned street lighting improvements also were under the jurisdiction of the Bureau. In July, 1958, by agreement with the Department of Public Works, the functions of all financing, design and construction of such improvements were transferred to that department but will continue to be subject to review and final approval by the Public Utilities Commission through this Bureau.

The activities of the two bureaus during the fiscal year were financed under the following five budgets:

Division	Total Budget, 1958-59
Hetch Hetchy Project	$ 10,628,118
Utilities Engineering Bureau	1,390,763
Bureau of Light, Heat and Power	3,692,331
1955 Hetch Hetchy Power Bond Fund	3,735,000 (a)
1956 Airport Bond Fund	4,715,000 (a)
TOTAL	$ 22,973,831 (b)

(a) Does not include funds previously appropriated for construction under way or completed during the fiscal year 1958-59.

(b) Excludes duplications due to budget transfers.

The total value of construction work performed under the direction of the bureau during the fiscal year on the Hetch Hetchy Project, the San Francisco International Airport, and the Municipal Railway was approximately $14,500,000. At the close of the year, an additional $17,000,000 of work was under construction.

II. HETCH HETCHY WATER SUPPLY AND POWER SYSTEM

Description

The Hetch Hetchy development is primarily a water supply project utilizing the precipitation and runoff of the upper Tuolumne River watershed, on the westerly slope of the Sierra Nevada Mountains, some 150 miles east of San Francisco Bay. This supply supplements that of local sources for the domestic water supply for the City of San Francisco and its suburban area.

Electric energy generated from the falling water is conveyed to San Francisco over transmission lines of the City, and of the Pacific Gas and Electric Company under a wheeling agreement, to supply all municipal needs including pumping stations, airport, street railway, street lighting and miscellaneous other loads. In addition, electric energy is served to two irrigation districts in the San Joaquin Valley to supplement their own power source, and to two industrial customers in Santa Clara County. Load requirements in excess of the City's Hetch Hetchy generation are supplied by power and energy purchased from the Pacific Gas and Electric Company.

Revenue received from electric power sales and from the wholesale delivery of water to the San Francisco Water Department for further transmission and ultimate distribution and sale to consumers, makes the project self-supporting.

The operating properties of the Hetch Hetchy water supply and power system are located in Tuolumne, Stanislaus, San Joaquin and Alameda Counties and include: eight dams with appurtenant impounding and regulating reservoirs, and diversion works; sixty miles of tunnels; ninety-five miles of aqueduct pipe lines; two powerhouses, at Moccasin and Early Intake; ninety-nine miles of 115,000-volt and sixty miles of 22,000-volt transmission lines; electric distribution, telephone and radio communication systems for project use; and appurtenant structures, maintenance and repair shops, and access roads.

The power system is being further expanded by current construction of the Canyon-Cherry Power Development financed from the 1955 Hetch Hetchy Power Bonds in the amount of $54,000,000. This expansion includes the addition of two new powerhouses (Cherry in 1960, Canyon in 1963), a 230,000-volt switchyard, a substation, sixty miles of 230,000-volt and 115,000-volt transmission lines and appurtenant structures. The generating capacity of the enlarged system will be over three times that of the present system.

Revenue and Expenditures

Revenue received in the operation of the Hetch Hetchy Project is derived from two main sources:

1. Wholesale delivery of water to the San Francisco Water Department.
2. Sales of electric power and energy to the San Francisco municipal departments, the Modesto and Turlock Irrigation Districts in the San Joaquin Valley, and two industrial customers located in Santa Clara County - Permanente Cement Company and an aluminum foil plant operated by Kaiser Aluminum and Chemical Corporation.

Revenue received from the sale of water and for standby service to the San Francisco Water Department for the fiscal year 1958-59 was $4,500,000 compared to $4,030,000 for the previous year.

Gross sales of electric energy during the year amounted to $5,379,000 compared to $4,901,000 during the previous year, an increase of 9.8 percent. Compared to last year, revenue from sales to the City's municipal departments increased 5.8 percent, to the Irrigation Districts, increased 26.5 percent, and to the industrial customers, increased 6.4 percent. The large increase in sales to the Districts reflects the continuing rapid increase in the electrical demand in the area served by the Modesto and Turlock Irrigation Districts in the San Joaquin Valley.

Revenue from sources other than sales of water and power was $258,457 for the fiscal year 1958-59. These sources include: insurance received on fire damage to generators at Moccasin Powerhouse - $81,628; sale of scrap copper wire removed from the Moccasin-Newark Transmission Line - $76,101; and service orders, rentals, meals, and other miscellaneous items.

In general, expenditures under the various appropriations were kept well within budget estimates. Because of heavy bond interest and redemption costs, total expenditures for the year exceeded total gross revenue by $45,561, which amount was made up from unappropriated surplus.

Due to the large increases in electric demand, particularly by the Irrigation Districts, expenditures increased considerably for purchase of supplemental power and energy for resale and for service charges for transmission and distribution of Hetch Hetchy power over the system of the Pacific Gas and Electric Company. Power and energy for resale was purchased in the amount of $1,519,210 compared to $1,043,428 last year. Service charges amounted to $1,260,219 compared to $1,190,585 last year. Bond interest and redemption costs on outstanding Hetch Hetchy bonds amounted to $5,746,001 for the fiscal year 1958-59.

Total taxes for the 1958-59 fiscal year on utility properties (real), under the jurisdiction of the Hetch Hetchy Project, located outside of San Francisco and assessed by six counties, four irrigation districts and one city, amounted to $26,778 based on a total assessed value of $473,087.

Tables 1, 2 and 6 show comparative data on receipts, expenditures, and sales of water and power in the operation of the Hetch Hetchy water supply and power system.

Water Storage and Diversion

Due to abnormal precipitation, the runoff on the Tuolumne River watershed for the fiscal year 1958-59 was the lowest since 1939. The seasonal total precipitation of Hetch Hetchy was 24.41 inches compared to an average seasonal total of 33.96 inches for the past 49-year period. Total runoff on that portion of the watershed supplying the City's reservoirs was approximately 59% of normal and Hetch Hetchy Reservoir did not spill.

Despite this relatively dry year, the large carryover storage in the reservoirs from the previous year, one of the wettest on record, enabled normal operation to be maintained. Although storage in Lake Lloyd and Lake Eleanor were drawn down to permit construction of the Eleanor-Cherry Diversion Tunnel, the City's obligations under the Raker Act to fulfill the requirements of the Modesto and Turlock Irrigation Districts were met entirely from storage in Lake Lloyd. It was not necessary to release any additional water for this purpose from Hetch Hetchy Reservoir. However, during the latter part of 1959, and until the first rains occur, it will be necessary to curtail generation at Intake Powerhouse.

Because of the low runoff, it was not necessary at any time during the year to release water from any of the reservoirs for flood control as provided for under agreement with the Corps of Engineers, U. S. Army.

During the year, 37,603 million gallons of water were diverted by the City from the Tuolumne River watershed through the Hetch Hetchy Aqueduct to the service area of the San Francisco Water Department. This makes a total of 492,292 million gallons diverted since the Hetch Hetchy Aqueduct was placed in operation in 1934. Table 3 shows comparative data on precipitation, runoff, storage, and delivery of the Hetch Hetchy water supply system.

Power System Operation

Operation of the City's two hydro-electric power plants at Moccasin and Early Intake continued normal during the year. Water storage in Lake Lloyd, formed by Cherry Dam, permitted full operation of Early Intake Powerhouse throughout the year for the third consecutive year since completion of the dam, compared to curtailed operation in the fall of previous years. Tables 4 to 7 inclusive, show operating statistics for the Hetch Hetchy power system.

During the year, due to the continued increase in electrical demand by its customers, the Hetch Hetchy system purchased approximately 202,400,000 kilowatt-hours of energy to supplement the generation of its own plants. The most notable increase in consumption is that of the Modesto and Turlock Irrigation Districts which purchased 258,100,000 kilowatt-hours of energy for the fiscal year 1958-59. In fact, at times the Districts' demand was over 70 percent of the maximum possible output of Moccasin Powerhouse.

On June 19, 1959, one circuit of the newly completed 230,000-volt transmission line between Moccasin and Jones Point, part of the Cherry Power Project, was placed in service temporarily on 22,000 volts. This temporary arrangement, pending completion of Cherry Powerhouse, permitted removal of the old wooden pole line connecting Moccasin and Intake Powerhouses, thereby reducing maintenance costs and transmission losses, and providing additional capacity for power requirements in the construction areas.

In line with the practice of a number of other electric utilities, new insulator washing equipment designed by the Bureau was placed in service for washing insulators on the City's 115,000-volt transmission line while the circuits are energized. This method utilizes a small high-pressure stream of cold, pure water directed at the insulators from a point on the tower at a distance of approximately fifteen feet. Grounding of the equipment and frequent checking of the electrical resistivity of the water used permit the crew to work in complete safety. The new method does the work in a much more thorough manner and in less time than the old methods of hand-washing on a de-energized line or wiping with cloths and "hot sticks" on an energized line, and should minimize costly line outages due to flashovers.

During the year, under a contract, tests were performed on the insulator bushings and the oil in the high voltage power transformers and oil circuit breakers in the Moccasin Switchyard. Most of the bushings, the majority of which were installed since 1948, are in excellent condition, but those which were installed prior to that date showed signs of deterioration and should be tested annually in the future. Tests on the insulation of the windings of the oil-filled power transformers indicated poor condition. Extensive analysis of samples of the transformer oil sent to a testing laboratory revealed that the cause was due to the deteriorated condition of the oil which has been in use since the plant was placed in operation in 1925. A study is under way to determine the most economical solution, either by a reclaiming process or by replacement of the oil.

Power Rates

A single set of rates for the sale of Hetch Hetchy power and energy was approved by the Board of Supervisors on March 26, 1958, and was made effective beginning July 1, 1958. The new set of rates reflected an increase in the level of competitive rates in the Northern and Central California area, and it took the place of two sets of rates previously in effect, one of which was applicable to City departments and the other to private customers.

The new rates were used as a basis for calculating billings to City departments during the fiscal year 1958-59, but the billings were in turn discounted to bring departmental expenditures into conformity with budget appropriations which were based on the old rates. Effective July 1, 1959, however, billings to City departments will be made subject to a uniform discount calculated to provide Hetch Hetchy power and energy for municipal purposes at cost. The discount amounts to 16.4 percent and is based on a determination of cost made by Mr. R. A. Wehe, rate consultant, as set forth in a report entitled "Cost and Rate Analysis, Hetch Hetchy Water and Power Divisions", submitted to the Public Utilities Commission on September 30, 1958.

The Wehe study also made a determination of the cost to serve the San Francisco International Airport with bulk power for resale by the Airport Department to its tenants. It was found that a discount of 1.7 percent applied to billings for this portion of the Airport's load would permit recovery of cost. Accordingly, it was made effective beginning July 1, 1959, with the result that the Airport receives a discount of 1.7 percent on billings for resale energy, and, in common with the other City departments, a discount of 16.4 percent on billings for its own departmental usage.

Improvements

During the fiscal year the following improvements to the operating properties of the Hetch Hetchy Project were completed:

Controls for the valves at the crossover connection between San Joaquin Pipe Lines Nos. 1 and 2, located at Albers Road south of Oakdale, were moved underground into the valve pit, ventilation for the pit was improved, and the unsightly temporary structures were removed.

A chronograph was installed at the overflow shaft of the Foothill Tunnel near the Oakdale Portal to provide a graphic record of the time and amount of intermittent spill which may occur at the shaft opening.

A small storage building was constructed at Miguel Meadows, between Hetch Hetchy Reservoir and Lake Eleanor, for use by City personnel in hydrographic and snow survey work.

At the Moccasin operating and maintenance headquarters, the surface areas of certain roadways were sealed with a slurry seal mixture, the roofs on five employee cottages were replaced, a new transformer substation was constructed for supplying the increasing electrical load in the shop area, and inoperative chlorination equipment for the domestic water supply system was replaced by an automatic chlorinator.

The deteriorated copper conductors in the westerly 9-mile section of the Moccasin-Newark 115,000-volt transmission line were replaced with aluminum conductors having a steel core. Prior to replacement, two serious breaks occurred due to structural failure of the conductor caused by metal fatigue and corrosion, apparently from vibration and exposure to salt air for over thirty years.

For the second year in a long range program, defective vibration dampers on the conductors of the Moccasin-Newark 115,000-volt transmission line, which were originally installed in 1930 and 1931, were replaced. To insure a maximum reliability of service to the City's power customers and to avoid any possible loss in revenue, the work was done by the City's line crews without removing the lines from service by utilizing "hot line" tools.

The steel transmission line towers at the westerly end of the Moccasin-Newark transmission line, built in 1925, are subject to salt air and coastal fog. Consequently, the original galvanizing protective coating of the tower members is deteriorating from corrosive action. During the year, under contract, twenty-five of these towers were reconditioned and painted.

Canyon-Cherry Power Development

Under the $54,000,000 bond issue approved by the electorate of San Francisco in November, 1955, the construction of two hydro-electric power plants was authorized as additions to the Hetch Hetchy power system.

The first plant, designated as the Cherry Power Project, now under construction, will utilize the water stored in Lake Eleanor and behind the recently completed Cherry Valley Dam. The water will be conveyed through a pressure tunnel six miles long to a point on the Cherry River near its confluence with the Tuolumne River. At this point the water will drop approximately 2,400 feet to the powerhouse to supply two generators having a combined nameplate capacity of 135,000 kilowatts. Cherry Powerhouse is scheduled to be in operation in the fall of 1960.

The second plant, the Canyon Power Project, will develop the power drop between O'Shaughnessy Dam and Early Intake Diversion Dam. At present, the water released from O'Shaughnessy Dam flows down the natural stream bed of the Tuolumne River to Early Intake where it is diverted through nineteen miles of tunnel to Moccasin Powerhouse. By constructing eleven miles of new pressure tunnel connecting to the reservoir at O'Shaughnessy Dam, a power drop of approximately 1,370 feet can be realized at Early Intake. It is estimated that the combined nameplate capacity of the two generators in this powerhouse will be 67,500 kilowatts. Engineering work is under way for construction of the Canyon Project, scheduled to be completed in 1963.

These two powerhouses will be located about three miles apart and will have a common switchyard at Early Intake. From the switchyard a new 230,000-volt transmission line will connect to a new transformer substation (Warnerville), near Oakdale, approximately 50 miles westerly. This substation will step down the voltage from 230,000 volts to 115,000 volts for delivery of power over a transmission line extending another 12 miles to serve the Modesto and Turlock Irrigation Districts. The substation will also provide a connection with the system of the Pacific Gas and Electric Company for emergency standby service.

Construction work continued during the year on the first stage of the Canyon-Cherry Power Development, which includes the Cherry Power Project and the joint switchyard, transmission and substation facilities of the Cherry and the future Canyon Power Project. All major contracts have been awarded for construction of the first stage, the total cost of which, including engineering, will approximate $30,000,000.

Eleven construction contracts and four equipment purchase contracts were awarded during the year, and three of each type were carried over from the previous year. Eight contracts were completed so that at the end of the fiscal year there were thirteen contracts active, representing a total amount of work of approximately $26,000,000. The total value of work on the new power development actually completed during the fiscal year 1958-59 was approximately $11,000,000.

The Cherry Power Tunnel between Lake Lloyd and Cherry Powerhouse, approximately six miles in length, was holed through on January 26, 1959. The Eleanor-Cherry Diversion Tunnel between Lake Eleanor and Lake Lloyd, approximately one mile in length, was holed through on May 18, 1959. At the end of the year, work on these tunnels was continuing with the installation of steel and concrete lining, construction of the tunnel portals, and excavation of the surge shaft near the downstream portal of the power tunnel.

Construction of the Cherry Powerhouse and penstock was started in October, 1958, and work was carried on through the winter. Work as of June 30, 1959, was approximately 35 percent complete.

Work was started also on the new switchyard at Early Intake for the power plants. The only available site in the area for the switchyard was occupied by old buildings which were demolished, including a dormitory and cookhouse used by Hetch Hetchy maintenance crews, and which were replaced by a larger and more suitable building nearby.

Clearing of the right-of-way for the new transmission line between Cherry Powerhouse and Modesto Substation J was completed during the year. Also, construction of the first section of the line from Moccasin to Jones Point was completed, and work on the second section between Moccasin and Substation J was started in April, 1959.

In June, 1959, a contract was awarded for the construction of the Warnerville Substation near Oakdale, and work was scheduled to start in July, 1959.

Engineering work was continued on the Canyon Power Project by both the Bureau's staff and that of Sverdrup and Parcel, Inc., who are furnishing under contract engineering services for the Canyon-Cherry Power Development. An access road to the Canyon Powerhouse site was completed during the year under the first construction contract for the Canyon Project.

Status of Hetch Hetchy Contracts

A summary of Hetch Hetchy construction contracts, including work on the Canyon-Cherry Power Development, in progress during the fiscal year 1958-59, is shown in Table 15.

New Don Pedro Dam

Under agreements for the development of the Tuolumne River watershed on a cooperative basis, studies are being carried on by the City of San Francisco, the Modesto and Turlock Irrigation Districts, and the Corps of Engineers, U. S. Army, for the development of additional storage capacity by the construction of a new dam on the Tuolumne River about a half mile downstream from the Districts' present Don Pedro Dam. This project, as proposed, will provide necessary additional storage space for the City in lieu of constructing more expensive storage facilities in the upper watershed, additional storage space and facilities for irrigation and power generation for the Irrigation Districts, and additional flood control space for the Corps of Engineers in its program for protection of the lower tuolumne River from flood damage.

To accomplish these purposes, it is proposed to construct the new dam with a reservoir capacity of not less than 1,200,000 acre-feet, over four times the size of the present one. The two Irrigation Districts will furnish the damsite, which they now own, and the lands which will be covered by the new reservoir. San Francisco will supply an estimated $40,000,000 and the Federal Government will supply an estimated $3,000,000 toward the cost of the dam. The Federal portion may be adjusted upward following re-evaluation of flood control benefits. This upward adjustment would correspondingly reduce the City's portion. For these expenditures, the City will acquire 570,000 acre-feet of storage space, and the Government will secure 340,000 acre-feet of flood storage space. Such portion of the latter space which is not reserved for flood control at any time will be available for conservation storage, 50 percent each to the City and the Districts. This will result in maximum possible storage space of 740,000 acre-feet available to the City in the new reservoir which will assure a dependable water supply for ultimate diversion of an estimated 400 million gallons daily to the Bay Area for domestic purposes, and which will safeguard the City's power revenues by assuring full capacity operation of its power plants.

During the year, the Modesto and Turlock Irrigation Districts employed Bechtel Corporation to study and report on the engineering feasibility of the project, including estimated costs. The report, currently under review, is based on three alternate reservoir capacities and covers comparative costs of concrete and rock fill dams, including necessary spillways, for each reservoir capacity.

Civil Defense Activities

All of the operating properties of the Hetch Hetchy water supply and power system are located outside the San Francisco Bay Area. Civil defense planning of the Bureau, therefore, is confined principally to providing information and establishing procedures which will serve as a guide to officials of various agencies and to Hetch Hetchy employees for performing the following functions during a state of emergency or disaster:

1. Operation of the water supply system of the Hetch Hetchy Project in accordance with the requirements of the San Francisco Water Department.

2. Operation of the electric generation and transmission system of the Hetch Hetchy Project in coordination with those of the Pacific Gas and Electric Company, the Modesto Irrigation District, and the Turlock Irrigation District.

3. Emergency repairs to essential facilities, as may be required.

4. Protection of properties against espionage and sabotage.

During the year, the new State of California "Civil Defense Operations Plan" was reviewed concurrently with the "Disaster Control Plan for the Hetch Hetchy Water and Power System". This was done to determine what revisions may be necessary in the Bureau's Manual of Procedure to conform to the concepts of total preparedness for non-military defense as incorporated in the new State plan.

Along with other electric utilities, the Bureau participated on May 8, 1959, in "Operation Alert - 1959", the annual nationwide civil defense exercise. So far as the utilities were concerned, emphasis this year was focused on the impact which fallout and the resulting dislocation of population will have on power supply and electrical load. As a corollary of this, emphasis was placed also on closer coordination between electric power liaison and local and State civil defense officials. In cooperation with the United States Department of Interior and the local Area Power Director, the Bureau completed and forwarded the "Action Record" for the Hetch Hetchy power system.

During June, 1959, the annual "Defense Production Security Survey" of the facilities of the Hetch Hetchy Project was conducted by the Provost Marshall Section, Headquarters, Sixth U. S. Army. This year, for the first time, the Hetch Hetchy properties were surveyed as a separate entity from those of the San Francisco Water Department. Other than several minor recommendations, the confidential report indicated that the findings were satisfactory.

During the year, a study was made of the preservation of essential records of the Bureau in the event of an enemy attack. At the close of the fiscal year, work was proceeding, under contract, on the microfilming of vital engineering records of date subsequent to the previous microfilming performed in 1943. The negatives will be stored in a safe place and contact prints will be used for index and reference purposes.

III. AIRPORT ENGINEERING AND CONSTRUCTION

General

The program for improvements to the San Francisco International Airport under the $25,000,000 Airport Bonds approved by the electorate in November, 1956, is well-advanced in planning, design and construction. Both in the terminal area and in the landing field areas the effects of construction are noticeable as the Airport facilities were expanded during the fiscal year in preparation for the "jet age". The major items of work accomplished are described below.

Construction Progress

The value of construction work performed at the Airport during the fiscal year under the direction of the Bureau totaled approximately $3,000,000.

The fill for extension of the main east-west runways to 9,500 feet in length and for extension of the crosswind runway to 9,000 feet was completed. Fill and grading for the improvement of Plots 5 and 16 in the maintenance base area were also completed during the fiscal year. The shoulders of the major travelled taxiways were widened and paved to prevent ingestion of extraneous material by jet engines. Plans and specifications for the paving of the runway extensions were completed, and the contract for this work was awarded at the end of the year. Reconstruction of existing landing field pavement continued with one contract completed and another contract awarded.

A portion of the circulation road system was completed and placed in operation. This roadway improved traffic conditions between the executive terminal area and the main terminal area.

In the terminal building, the front doors leading to the baggage lobby and ticket lobby were converted to automatic operation, and escalators between the two lobbies were installed. The enlargement of the sixth floor of the terminal building was also completed. This enlarged space occupied by the Federal Aviation Agency is used to house additional navigational aids, thereby improving flight safety. Construction was completed on Pier E and its connecting concourse extending from the south end of the terminal building. This added five large passenger holding rooms with related facilities. Construction was started on the extension to Pier B. All the foundation and major structural work on this structure was completed at the end of the fiscal year. Upon completion, Pier B will have available five positions for large jet aircraft and two positions for smaller aircraft.

The balance of construction performed during the year involved improvements to the Airport electrical system, sewerage system, drainage system and boiler plant. As in previous years, some silt removal operations were carried out in the Airport canal system.

Status of Airport Contracts

A summary of the Airport construction contracts in progress during the fiscal year 1958-59 is shown in Table 16.

Planning for Future Work

A Master Plan for development of the Terminal Area Complex was prepared by the architectural firm of Welton Becket and Associates and was approved in principle by the Public Utilities Commission and the Art Commission. The firm was authorized to commence the preparation of preliminary plans for the major structures of Stage 1, namely the Secondary Terminal and Piers F and G.

Plans and specifications were prepared for extending the road system to San Bruno Avenue, and design was started on improvements to the main entrance and concession area roads. This work, when completed, will improve the flow of vehicular traffic within the Airport area.

Plans and specifications were also prepared for constructing two air cargo buildings, each 420 feet long by 80 feet wide, and related work, including utility extensions and paved automobile, truck, and aircraft parking areas. All of this work is to be performed during the next fiscal year.

Studies are being made and plans are being prepared for extension of the water, sewerage, drainage, and power systems required by the rapid growth of the Airport. Also underway are studies relative to preparing a revised master plan for the entire Airport area. These studies are based on the latest available jet aircraft operating data and aircraft movements under instrument flying conditions.

Financing

Under the $25,000,000, 1956 Airport Bond program, the amount of $20,910,000 has been appropriated to date and a total of $4,436,000 in construction contracts has been awarded. Also, during the year, $2,700 of work was awarded from Airport operating funds.

During the year, the Federal Government, through the Federal Aviation Agency, allocated to the City $1,000,000 for subventions. Funds received during the year from the Federal Aviation Agency for construction work completed under grants of previous years totaled $702,000.

Taxes

The total land area, total assessed value, and total taxes paid for Airport property for the fiscal year 1958-59 compared with the two previous years are as follows:

	1956-57	1957-58	1958-59
Area (acres)	3330.66	3345.06	3345.06
Assessed Value	$1,164,570	$1,164,786	$1,164,786
Taxes Paid	$71,574	$74,008	$81,629

IV. MUNICIPAL RAILWAY ENGINEERING AND CONSTRUCTION

General

Work continued on the design and preparation of plans and specifications for routine rehabilitation of the Municipal Railway properties. In addition, plans were prepared for changes to the facilities as made necessary by the State's Freeway construction program.

The construction work carried on during the fiscal year was financed from the Municipal Railway Operating Fund, the Municipal Railway Reconstruction and Replacement Fund, the Department of Public Works, and the Bank of America. The latter financing covered the construction of a new feeder duct line occasioned by the construction of a new Bank of America office building at Eleventh and Market Streets.

Projects started or completed during the fiscal year are described in general as follows:

Overhead and Underground Construction

The widening and channelization of upper Market Street required the relocation of poles and trolley coach overhead for the No. 33 Line.

Upper Market Street was declared an underground district, requiring the installation of a new duct line for the trolley coach feeder system.

Construction of the Fifth and Mission Parking Garage required the relocation of trolley poles and overhead feeders on Fifth Street and on Mission Street.

Construction of a new feeder duct line to bypass the excavation for the new Bank of America Building at Eleventh and Market Streets was completed.

The relocation of the trolley coach overhead for the No. 30 Line on Third, Fourth, Stockton, and Kearny Streets was completed on December 14, 1958. This work was required to conform with the revised one-way street pattern.

With completion of the construction of the Central Freeway from Mission Street to Turk Street, plans and specifications are being prepared for the final arrangement of the trolley coach overhead and feeders at Mission and Otis Streets and at Duboce Avenue. This work will be done during the next fiscal year.

Track Paving Reconstruction

Plans and specifications are being prepared for the removal of basalt paving blocks and for the replacement with concrete pavement on California Street from Van Ness Avenue to Mason Street. This work will start shortly after July 1, 1959.

Buildings and Structures

The certification of the contract for the alterations to the Mason and Washington cable carhouse was held in abeyance pending a decision in the litigation for the restoration of the Washington-Jackson cable car line.

Plans and specifications for new waiting shelters and for repairs to the balustrade wall at the East Portal of the Twin Peaks Tunnel are being prepared.

Status of Municipal Railway Contracts

A summary of the Municipal Railway construction contracts in progress during the fiscal year 1958-1959 is shown in table 17.

Rapid Transit

On May 18, 1959, the Board of Supervisors appropriated the sum of $125,000 for the purpose of conducting a transit study for the City of San Francisco in coordination with the survey to be undertaken by the San Francisco Bay Area Rapid Transit District. The study will involve preparation of preliminary plans, design, and estimates for a local San Francisco transit system, and recommendations pertaining to San Francisco's requirements in connection with the proposed San Francisco Bay Area Rapid Transit System. Funds for this study are administered by the Chief Administrative Officer, and the study is being conducted under the direction of this Bureau. The consulting engineering firm of De Leuw, Cather & Company has been retained for services in the specialized fields of Rapid Transit.

One of the first projects to be undertaken will be a cordon count of all vehicles entering the Metropolitan Traffic District during a twelve hour period from 7 A.M. to 7 P.M. This count is scheduled to be made during the month of July, 1959, utilizing personnel from the Utilities Engineering Bureau, Department of Public Works, Department of City Planning, and the Municipal Railway.

V. STREET LIGHTING

General

The lighting of public streets within the City and County of San Francisco is provided by City-owned facilities, by facilities furnished under an annual contract with the Pacific Gas and Electric Company, and by jointly-owned facilities of the City and the Company.

During the fiscal year 1958-59, maintenance and repair of City-owned installations were performed under contract, and included group and individual lamp replacements, glassware replacement, painting, repair of defective and damaged equipment, and miscellaneous work. Under another contract, the Pacific Gas and Electric Company furnished street lighting service as ordered by the Bureau, which includes maintenance of the equipment, furnishing electric service, switching and control of street lighting circuits, and certain emergency work as required. Electric energy for all street lighting operation within the City is supplied from the City's Hetch Hetchy power system.

During the year, studies were continued on the general planning of the overall requirements for the illumination of public ways. Detail planning and design for changes, improvements, and additions to City-owned facilities in connection with street improvement projects were performed by the Bureau of Engineering, Department of Public Works, subject to final approval of the Public Utilities Commission.

Operation and Maintenance

On June 30, 1959, the total number of City-owned and Company-owned street lights in service in public streets, parks, viaducts, tunnels, and underpasses was 28,592, an increase during the year of 235. Table 11 shows a summary of the number and type. During the fiscal year 1958-59, a total of $991,601 was expended for the operation, maintenance, and repair of the street lighting system in San Francisco, an average of approximately $34.60 per unit. Of the total expenditure, $12,052 was paid by the State from gas tax funds, which covers half the cost of operation and maintenance of street lighting on those City streets which are part of the State highway system. A summary of the expenditures for the fiscal year is shown in Table 12.

Improvements

New City-owned installations were completed during the year at a cost of $182,200 and were financed principally by the Department of Public Works under street improvement programs, and a tract owner. A summary of these improvements is shown in Table 13.

A study was made of the street lighting requirements for the access streets in the area leading to Candlestick Park. The Pacific Gas and Electric Company on orders issued by the Bureau, and the Department of Public Works, under contract, will install the necessary lighting.

Complaints and Damages

During the year, 151 complaints and requests for service were investigated and acted on in connection with street lighting operations. These involved inadequate illumination, objectionable glare in windows, and requests from property owners for relocation of street lighting poles.

Also during the year, 49 accidents occurred involving damage to City-owned street lighting property. In each case, investigation was made as soon as possible to ensure that public hazards and obstructions to traffic were avoided and further, to secure reimbursement, if possible, from the responsible party for the cost of repairs. Claims for such costs billed by the Bureau during the year amounted to $7,832, and collections amounted to $5,931.

VI. UTILITY SERVICES TO MUNICIPAL DEPARTMENTS

General

Electric energy supplied to municipal departments is generated by the City's Hetch Hetchy power system and is delivered to the various service points by means of the transmission and distribution facilities of the Pacific Gas and Electric Company under a wheeling contract. The natural gas and steam supplied to municipal departments are furnished by Pacific Gas and Electric Company under the provisions of its annual contract with the Bureau.

Municipal Consumption of Electricity, Gas and Steam

During the fiscal year 1958-59, a total of 235,557,361 kilowatt-hours of electricity was supplied, through 888 accounts, for municipal uses, including street lighting and traffic devices. Payment for electricity by the City departments in the total amount of $2,557,389 was made through the Bureau to the Hetch Hetchy Project. At the same time, a total of 11,070,216 hundred-cubic-feet of natural gas was consumed through 538 accounts, and a total of 1,547,100 pounds of steam was consumed through one account, for which the Pacific Gas and Electric Company was paid a total of $562,124 and $2,254, respectively. A summary of the consumption and expenditures for these commodities supplied to each municipal department is shown in Tables 9 and 10.

San Francisco International Airport

The Bureau renders service to the San Francisco International Airport in the operation of the City-owned electric distribution system within the Airport boundary by supervising the installation and testing of the associated metering facilities, by performing the necessary monthly meter readings, and by preparing the corresponding billings for presentation by the Airport Department to the various private tenants. During the fiscal year, 64 tenants were supplied a total of 37,239,880 kilowatt-hours of electricity, through 127 metered and 63 unmetered accounts, for which the Airport collected $461,216.

Statistical Records

Following a detailed study during the year, procedures have been initiated to utilize IBM punched cards for compiling and maintaining statistical records for over 1400 electric, gas, and steam accounts for municipal departments. The new method consists essentially of mechanical reproduction of the IBM cards which the Pacific Gas and Electric Company routinely prepares monthly for each account. These reproduced cards, with some additional data punched in by using the services of the Central Tabulating Bureau of the Purchasing Department, are electrically tabulated by the latter at intervals to provide the required statistical data. It is estimated that an annual net saving of $3,900 will be realized by the use of this method.

TABLE 1.
HETCH HETCHY WATER SUPPLY & POWER SYSTEM

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES (INCLUDING ENCUMBRANCES)
FISCAL YEAR 1958-59

OE	DESCRIPTION	BUDGET	ACTUAL	-UNDER OVER
110	Permanent Salares	$ 359,602	$ 336,483	$ -23,119
111	Allowance for Overtime	1,500	1,491	-9
112	Allowance for Holidays	6,600	6,596	-4
120	Temporary Salaries	17,000	17,714	714
130	Wages (Net Appropriation)	409,975	398,727	-11,248
130	Wages (Gardeners)	17,740	17,740	-0-
	Subtotal (Personal Services)	812,417	778,751	-33,666
200	Contractual Service	15,042	15,067	25
216	Maint. & Repair of Auto. Equip.	33,000	29,328	-3,672
231.0	Heat, Light & Power	500	407	-93
231.1	Purchase of Power for Resale	1,840,000	1,519,210	-320,790
231.2	Service Charge for Transm.& Dist.	1,225,000	1,260,219	35,219
251	Subsistence of Employees	11,500	13,781	2,281
265	Valuation of Properties	10,000	7,500	-2,500
269	Maintenance of Radio System	5,250	5,182	-68
284	Subsistence of Official Visitors	2,500	2,342	-158
300	Material and Supplies	50,713	54,354	3,641
350	Foodstuffs	17,500	8,191	-9,309
640	Water Rights and Damage Claims	14,000	9,182	-4,818
641	Hydrography	20,500	21,505	1,005
801	Accident Compensation	6,000	4,152	-1,848
804	Injuries and Damages	-0-	12,947	12,947
812	Fidelity Insurance	33	33	-0-
813	Automobile Insurance	3,300	3,454	154
814	Fire Insurance	5,400	5,370	-0-
815	Miscellaneous Insurance	10,000	5,870	-4,130
854	Membership Dues	51	25	-26
855	Fee to U.S. Gov't-Raker Act	30,000	30,000	-0-
856	Maint.of Roads & Trails-Raker Act	25,000	12,684	-12,316
857	Bond Sales Expense	-0-	1,662	1,662
860	Retirement Allowance	103,686	98,525	-5,161
865	Health Service System	2,182	2,114	-68
870	Taxes	24,500	26,778	2,278
880	Rentals - Transmission Lines	54,000	54,000	-0-
900	Services of Other Depts.	408,055	396,893	-11,162
	TOTAL OPERATION & MAINTENANCE	4,730,129	4,379,526	-350,603
400	Equipment	14,640	13,433	-1,207
756	Reconstruction & Replacement	41,940	41,940*	-0-
757	Additions and Betterments	2,160	2,160*	-0-
720	Bond Redemption	3,747,495	3,722,495	-25,000
830	Bond Interest	2,091,754	2,023,506	-68,248
	TOTAL MISCELLANEOUS	5,897,989	5,803,534	-94,455
	GRAND TOTAL	$10,628,118	$10,183,060	$-445,058

* Unexpended balance transferred to unallocated balance of appropriation.

TABLE 2

HETCH HETCHY WATER SUPPLY & POWER SYSTEM

SUMMARY OF RECEIPTS & EXPENDITURES
FISCAL YEAR 1958-59

RECEIPTS	BUDGET	ACTUAL	-UNDER OVER
Revenue from Sale of Electric Energy	$ 5,630,500	$ 5,379,042	$ -251,458
Revenue from Sale of Water and Standby Charge, S.F.W.D.	4,500,000	4,500,000	-0-
Insurance on Fire Damage, Moccasin PH	-0-	81,628	81,628
Sale of Scrap Copper Wire	-0-	76,101	76,101
Other Revenue	65,000	100,728	35,728
TOTAL GROSS REVENUE	$10,195,500	$10,137,499	$ -58,001
Receipts from Unappropriated Surplus	432,618	432,618	-0-
TOTAL REVENUE AND SURPLUS	$10,628,118	$10,570,117	$ -58,001
EXPENDITURES			
Total Expenditures (from Table 1)	10,628,118	10,183,060	-445,058
EXCESS OF REVENUE & SURPLUS OVER EXPENDITURES	-0-	$ 387,057	$ 387,057

COMPARISON OF REVENUE AND EXPENDITURES

Total Gross Revenue	$ 10,137,499
Total Expenditures	10,183,060
Excess of Expenditures over Gross Revenue	$ 45,561

TABLE 3
HETCH HETCHY WATER SUPPLY

PRECIPITATION, RUNOFF, STORAGE AND DELIVERY
AS OF JUNE 30 BY FISCAL YEARS

	Normal	1954-55	1955-56	1956-57	1957-58	1958-59
SEASON PRECIPITATION (INCHES)						
Hetch Hetchy	33.96	25.78	52.23	29.09	44.37	24.41
Lake Lloyd	-	31.78	69.44	39.98	59.02	29.77
Approx. percent of Normal		76%	154%	86%	131%	72%
WATERSHED RUNOFF (ACRE-FT.) (a)						
Hetch Hetchy	723,100	513,031	1,263,881	641,776	988,864	410,400 (b)
Lake Lloyd	263,300	197,084	450,437	242,037	370,010	172,800 (b)
Lake Eleanor	157,900	105,576	250,276	140,652	227,775	90,900 (b)
Total	1,144,300	815,691	1,964,594	1,024,465	1,586,649	674,100 (b)
Approx. percent of Normal		71%	172%	90%	139%	59%
RESERVOIR STORAGE (ACRE-FT.)	No-Spill Capacity					
Hetch Hetchy	360,300	341,024	347,040	361,746	341,606	315,258
Lake Lloyd	268,200	(d)	185,985	268,236	264,372	80,792 (c)
Lake Eleanor	26,200	27,210	24,472	16,280	23,634	4,198 (c)
Total	654,700	368,800	557,497	646,258	629,612	400,248
DELIVERY TO S.F.W.D. (MILLION GALLONS)						
Average per day		103.8	85.8	97.3	81.0	103.0
Maximum per day		158.3	127.8	134.9	137.0	160.8
Total for fiscal year		37,887	31,438	35,505	29,558	37,603
Total since operation of Hetch Hetchy Aqueduct began in 1934.						492,292

Note: One acre-foot equals 325,900 gallons or approximately 1/3 million gallons.
(a) For Water Year, November 1 to October 31.
(b) Estimated.
(c) Drawn down to permit construction of Eleanor-Cherry Diversion Tunnel.
(d) Cherry Dam and Lake Lloyd Reservoir placed in operation October 27, 1955.

TABLE 4.

HETCH HETCHY POWER SYSTEM

ELECTRIC ENERGY GENERATED, PURCHASED AND DISTRIBUTED

FISCAL YEAR 1958-59

PLANT DATA	Capacity (KW) Rated	Capacity (KW) Short Time	Annual Load Factor - %
Moccasin Powerhouse	70,000	82,000	73.5
Early Intake Powerhouse	3,600	3,900	81.7
Total	73,600	85,900*	73.8

ENERGY GENERATED AND PURCHASED (KW-HR)		
Gross Generation		
Moccasin Powerhouse	527,771,000	
Early Intake Powerhouse	27,918,000	555,689,000
Station Service		
Moccasin Powerhouse	747,900	
Early Intake Powerhouse	41,448	789,348
Net Generation		554,899,652
Purchased from P.G.& E. Co.		202,433,126
Total Available		757,332,778

ENERGY DISTRIBUTED (KW-HR)	
Project Use	3,007,776
Sales	
Municipal Accounts	235,557,361
Modesto Irrigation District	192,134,400
Turlock Irrigation District	66,007,346
Permanente Cement Company	166,572,310
Kaiser Aluminum & Chemical Corporation	12,000,000
Miscellaneous Customers	6,585,970
Pacific Gas and Electric Company	0
Losses and Unaccounted For	
Hetch Hetchy System	32,221,760
P.G.& E. System (For Municipal & Permanente Accounts)	43,245,855
Total	757,332,778

*Coincidental Demand

TABLE 5.

HETCH HETCHY POWER SYSTEM

COMPARATIVE ELECTRIC ENERGY CONSUMPTION BY CUSTOMERS

FISCAL YEARS 1958-59 AND 1957-58

(Nearest 100,000 KWH)

CUSTOMER	1958-59	1957-58
Municipal Accounts:		
Street Lighting	35,300,000 KWH	34,400,000 KWH
Public Works	18,100,000	17,900,000
S.F. International Airport	43,000,000	38,100,000
Municipal Railway	64,700,000	64,800,000
Water Department	35,600,000	29,100,000
S.F. Unified School District	14,300,000	14,000,000
Other City Departments	24,600,000	22,500,000
Modesto-Turlock Irrigation Districts	258,100,000	216,200,000
Permanente Cement Company	166,600,000	156,500,000
Kaiser Aluminum & Chemical Corp.	12,000,000	14,600,000
All Other Sales	6,600,000	7,200,000
TOTAL	678,900,000 KWH	615,300,000 KWH

TABLE 6.

HETCH HETCHY POWER SYSTEM

COMPARATIVE GROSS REVENUE RECEIVED FROM SALE OF ELECTRIC ENERGY

FISCAL YEARS 1958-59 AND 1957-58

(Nearest $1,000)

CUSTOMER	1958-59	1957-58
Municipal Accounts:		
Street Lighting	$ 463,000	$ 451,000
Public Works	250,000	218,000
S.F.International Airport	334,000	303,000
Municipal Railway	600,000	601,000
Water Department	297,000	254,000
S.F. Unified School District	263,000	255,000
Other City Departments	380,000	364,000
Modesto-Turlock Irrigation Districts	1,256,000	993,000
Permanente Cement Company	1,380,000	1,267,000
Kaiser Aluminum and Chemical Corp.	82,000	107,000
All Other Sales	74,000	88,000
TOTAL	$5,379,000	$4,901,000

TABLE 7.
HETCH HETCHY POWER SYSTEM

ELECTRIC ENERGY DISTRIBUTION BY FISCAL YEARS
Kilowatt Hours

	1953-54	1954-55	1955-56	1956-57	1957-58	1958-59
PROJECT USE	2,545,946	3,025,555	2,938,389	3,322,249	3,439,140	3,007,776
SALES						
Municipal Accounts	191,546,465	206,929,143	214,040,036	219,993,788	220,814,868	235,557,361
Modesto Irrig. Dist.	157,842,000(a)	203,364,000(a)	176,712,000(a)	219,024,000(a)	179,601,000	192,134,400
Turlock Irrig. Dist.	-	-	-	-	36,621,604	66,007,346
Permanente Cement Co.	141,422,490	141,889,000	139,566,100	156,069,290	156,458,000	166,572,310
Kaiser Aluminum Corp.	7,704,000	12,168,000	14,496,000	16,128,000	14,616,000	12,000,000
Riverbank Ord. Plant	22,685,893	7,647,460	6,890,130	7,130,385	4,587,573	-
Misc. Customers (b)	1,773,559	7,561,315	3,319,315	633,767	2,528,934	6,585,970
Pacific Gas & Elec. Co.	14,734,648	1,394,334	7,111,058	0	97,296	0
LOSSES & UNACCOUNTED FOR	62,907,366	65,734,449	69,117,128	73,593,993	72,299,267	75,467,615
TOTAL	603,162,367	649,713,256	634,190,156	695,895,472	691,063,682	757,332,778
PURCHASED FROM P.G.& E. CO.	74,038,767	118,156,156	84,435,156	139,552,972	135,797,585	202,433,126
HETCH HETCHY NET GENERATION	529,123,600	531,557,100	549,755,000	556,342,500	555,266,097	554,899,652

(a) Includes Turlock Irrigation District

(b) Includes power required for construction activities

TABLE 8

BUREAU OF LIGHT, HEAT & POWER

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES (INCLUDING ENCUMBRANCES)

FISCAL YEAR 1958-59

O.E.	DESCRIPTION	BUDGET	ACTUAL	-UNDER OVER
110	Permanent Salaries	$ 97,400	$ 83,413	$ -13,987
111	Allowance for Overtime	850	795	-55
200	Contractual Services	1,197	2,639	1,442
214	Alteration & Repair of Structures (Jointly-owned Street Lighting)	5,000	1,138	-3,862
214.1	Maintenance & Repair of Facilities (City-owned Street Lighting)	70,000	72,948	2,948
216	Maint.& Repair of Auto.Equip.	700	900	200
219	Alterations to Secure Lower Rates	1,200	-0-	-1,200
231.1	Public Building Lighting	78,000	71,959	-6,041
231.2	Lighting of Public Sts.P.G.&E.	459,867	445,706	-14,161
231.3	Lighting of Public Sts. Hetch Hetchy	453,711	465,406	11,695
231-XXX	Electricity & Gas-Interdepart.	2,507,946	2,631,603	123,657
300	Materials and Supplies	1,375	616	-759
400	Equipment	2,100	382	-1,718
801	Accident Compensation	60	-0-	-60
813	Auto Insurance	207	231	24
815	Miscellaneous Insurance	311	-0-	-311
854	Membership Dues	25	-0-	-25
860	Retirement Allowance	12,161	11,213	-948
865	Health Service System	221	219	-2
	TOTAL	$ 3,692,331	$ 3,789,168	$ 96,837

TABLE 9
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR ELECTRICITY BY MUNICIPAL DEPARTMENTS
FISCAL YEAR 1958-59

DEPARTMENT	NO. OF ACCTS.	CONSUMPTION KILOWATT-HOURS	EXPENDITURE
Public Buildings	8	3,982,183	$ 47,513.13
City Planning	1	80,160	1,697.06
Disaster Corps	9	4,535	136.77
Fire	66	1,338,338	32,995.75
Police	20	602,380	13,791.79
Public Welfare	2	268,720	4,121.16
Sheriff	2	820,120	9,184.34
Juvenile Hall	1	932,880	10,617.42
Log Cabin Ranch	9	151,985	4,166.87
Electricity	6	225,447	4,897.01
Farmer's Market	1	6,040	167.34
Real Estate-Auditorium	7	1,070,436	16,369.57
Registrar of Voters	3	10,988	293.77
Purchasing	12	142,804	3,318.95
Public Works	44	18,039,805	231,605.84
Health	21	4,131,674	48,019.73
Hassler Health Home	1	545,280	6,977.74
Legion of Honor	5	239,668	4,950.89
De Young Museum	2	323,360	5,835.96
Library	28	1,457,100	25,888.18
Recreation & Park	167	6,374,063	107,911.34
San Francisco Unified School Dist.	256	14,328,199	262,851.61
Child Care Centers	8	49,546	1,383.24
War Memorial - General	2	657,744	10,263.30
Art Museum	-	435,456	5,987.91
International Airport	8	42,965,894	334,015.09
Municipal Railway	40	64,722,276	599,792.58
Water	91	35,553,683	297,262.83
Hetch Hetchy Project	5	7,062	314.73
Real Estate	13	12,372	342.50
Employee's Retirement System	1	73,304	1,617.54
Street Lighting Operation	45	35,327,127	463,097.08
TOTAL BY MUNICIPAL DEPARTMENTS	884	234,880,629	$ 2,557,389.02
Academy of Sciences	1	676,732	11,475.28
State Hwy.Lighting & Traffic Devices	3	*	17,828.40
GRAND TOTAL	888	235,557,361	$ 2,586,692.70

*The State of California pays one-half the cost of operation and maintenance of street lighting and traffic signals on those City streets which are part of the State Highway System. The energy for street lighting is included under Street Lighting Operations. The energy for the traffic devices is included under the Department of Public Works.

TABLE 10.
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR GAS AND STEAM BY MUNICIPAL DEPARTMENTS
FISCAL YEAR 1958-59

NATURAL GAS

DEPARTMENT	NO. OF ACCTS.	CONSUMPTION IN HUNDRED CU. FT.	EXPENDITURE
Public Buildings	2	530,414	$ 24,542.45
City Planning	1	4,000	237.56
Disaster Corps	7	711	73.18
Fire	82	401,062	23,465.31
Police	11	57,766	3,930.44
Single Men's Rehab. Center	1	39,272	2,376.51
Sheriff	3	406,916	18,912.40
Juvenile Hall	2	391,606	18,153.37
Electricity	3	8,215	497.60
Farmer's Market	1	490	38.53
Real Estate-Auditorium	2	1,970	134.08
Registrar of Voters	2	2,582	167.51
Purchasing	7	12,332	746.56
Public Works	12	404,848	25,191.70
Health	19	3,577,414	154,535.30
Hassler Health Home	2	278,929	16,559.09
DeYoung Museum	1	11,338	649.48
Library	26	71,306	4,308.27
Recreation and Park	96	879,220	49,819.86
San Francisco Unified School Dist.	199	3,002,669	166,010.42
Child Care Centers	8	19,634	1,202.50
War Memorial-General	3	167,410	9,368.66
International Airport	12	566,184	26,853.14
Municipal Railway	12	177,278	10,688.68
Water	15	51,848	3,328.83
Hetch Hetchy Project	2	1,482	134.44
Real Estate	7	3,320	197.80
TOTAL	533	11,070,216	$562,123.67

STEAM
(Does not include steam generated by City)

DEPARTMENT	NO. OF ACCOUNTS	CONSUMPTION IN POUNDS	EXPENDITURE
Public Welfare	1	1,547,100	$ 2,253.60

TABLE 11
BUREAU OF LIGHT, HEAT AND POWER

STREET LIGHTS IN SERVICE
JUNE 30, 1959

	COMPANY-OWNED	JOINTLY-OWNED	CITY-OWNED
UNDERGROUND CONNECTED			
High voltage series circuits:			
1,000 Lumen incandescent	-	44	-
2,500 " "	299	312	464
4,000 " "	2,555	545	2,702
6,000 " "	789	649	4,633
10,000 " "	999	45	520
20,000 " Fluorescent	5	-	25
20,000 " Mercury vapor	-	-	25
Low voltage multiple circuits:			
1,000 Lumen incandescent	-	-	171
2,500 " "	8	-	17
4,000 " "	177	1	22
6,000 " "	154	9	-
10,000 " "	-	-	8
20,000 " Fluorescent	36	-	71
20,000 " Mercury vapor	-	-	16
OVERHEAD CONNECTED			
High voltage series circuits:			
2,500 Lumen incandescent	325	-	-
4,000 " "	12,693	-	31
6,000 " "	200	-	-
Low voltage multiple circuits:			
2,500 Lumen incandescent	3	-	-
6,000 " "	39	-	-
TOTAL	18,282	1,605	8,705
	63.9%	5.6%	30.5%

GRAND TOTAL:	June 30, 1959	28,592
	June 30, 1958	28,357
	Increase during the year	235

TABLE 12

BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURES FOR OPERATION AND MAINTENANCE OF STREET LIGHTING
FISCAL YEAR 1958-59

CONTRACTUAL SERVICE (P. G. & E. COMPANY)			
Company-owned facilities (a)	$688,325.78		
Jointly owned facilities (a)	67,113.40		
City owned facilities (b)	165,416.78		
Emergency service to City-owned facilities	1,156.44	$922,012.40	
Less deduction for energy		475,149.87	$446,862.53
CONTRACTUAL SERVICE (R. FIATIAND COMPANY)			
Maintenance of City owned facilities:			
Group replacement of lamps	34,843.42		
Replacement of lamp outages	7,287.72		
Glassware, painting and miscellaneous	4,809.70	46,940.84	
Repair of City owned facilities:			
Failure of equipment	6,071.07		
Damages by vehicles (c)	16,039.14	22,110.21	69,051.05
WORK BY MUNICIPAL RAILWAY			
Extensions to trolley poles to accommodate street lights			538.47
ELECTRIC ENERGY (HETCH HETCHY)			
35,327,127 Kilowatt-hours @ $0.01345			475,149.87
			991,601.92
LESS: Amount paid from Gas Tax for State Highway routes			12,052.79
TOTAL NET EXPENDITURE			$979,549.13

(a) Includes maintenance, repair, and fixed charges of Company-owned facilities, and electric energy.

(b) Includes service and switching charge, and electric energy.

(c) Where responsible party is known, claim is filed for reimbursement.

TABLE 13

BUREAU OF LIGHT, HEAT AND POWER

NEW CITY-OWNED STREET LIGHTING INSTALLATIONS

COMPLETED DURING 1958-59

Location	No. of Lights	Type of Light*	Source of Funds	Value
Market Street - Hattie to Corbett	126	Inc.	DPW	$ 46,146
Geary Boulevard - Presidio to 33rd	268	Inc.	DPW	125,220
Embarcadero - Howard to Broadway	2	Inc.	State	626
Marietta Drive - Arroyo to Teresita	26	Inc.	Private	10,231
TOTAL	422			$ 182,223

* Inc. = Incandescent lamp

TABLE 14

BUREAU OF LIGHT, HEAT AND POWER

HISTORICAL COST OF CITY-OWNED STREET LIGHTING FACILITIES

	City Funds				Housing	Federal	State	Property	
	P. U. C.	D. P. W.	Park	Muny.Ry.	Auth.	Funds	Funds	Owners	Total
	$	$	$	$	$	$	$	$	$
Prior to July 1, 1932	-	223,185	-	-	-	-	-	22,370	245,555
Fiscal year 1932-33	-	37,288	-	-	-	-	-	-	37,288
1933-34	-	71,005	-	-	-	-	-	-	71,005
1934-35	93,550	18,618	-	-	-	-	-	6,652	118,820
1935-36	15,110	9,540	-	-	-	15,592	-	7,649	47,891
1936-37	172,079	22,863	-	-	-	84,874	-	33,049	312,865
1937-38	69,805	15,069	-	-	-	112,191	-	14,444	211,509
1938-39	6,458	13,721	-	-	-	48,033	-	25,353	93,565
1939-40	9,957	7,072	-	-	-	75,380	-	14,339	106,748
1940-41	5,380	10,910	-	-	-	45,376	-	40,827	102,493
1941-42	1,980	2,445	-	-	-	13,720	-	32,800	50,945
1942-43	3,969	8,345	-	-	-	-	-	3,718	16,032
1943-44	470	4,902	-	-	-	-	-	371	5,743
1944-45	450	-	-	-	-	-	-	5,738	6,188
1945-46	298	-	1,166	-	-	-	-	350	1,814
1946-47	4,357	-	-	-	-	-	-	-	4,357
1947-48	112,615	76,768	14,295	1,110	-	-	-	112,847	317,635
1948-49	257,652	9,043	-	-	-	-	-	22,987	289,682
1949-50	303,629	27,194	6,350	-	-	-	-	12,394	349,567
1950-51	155,842	101,576	-	-	-	-	-	165,043	422,461
1951-52	27,154	47,698	-	5,806	-	-	22,650	23,695	127,003
1952-53	251,090	219,956	-	505	-	-	-	31,778	503,329
1953-54	142,151	22,181	-	-	1,239	-	2,274	23,495	191,340
1954-55	115,727	30,817	-	-	543	-	16,578	748	164,413
1955-56	15,704	48,620	-	-	1,360	-	19,181	2,484	87,349
1956-57	114,168	26,641	-	-	3,003	-	-	7,256	151,068
1957-58	2,501	64,942	-	-	-	-	4,142	18,199	89,784
1958-59	-	171,367	-	-	-	-	626	10,231	182,224
Total: June 30, 1959	1,882,096	1,291,766	21,811	7,421	6,145	395,166	65,451	638,817	4,308,673
Less: Accrued portions removed									127,363
Remaining original cost: June 30, 1959									$ 4,181,310

TABLE 15

HETCH HETCHY WATER SUPPLY & POWER SYSTEM

CONSTRUCTION CONTRACTS

FISCAL YEAR 1958-59

Contract No.	Description	Contractor	Contract Time Started	Contract Time Completed	Original Contract Price	Value of Work Done During Fiscal Year
HH-289	Furnish and Install Generators, Cherry Powerhouse	Allis-Chalmers Mfg. Co.	7-15-57	-	$ 3,169,520(a)	$ 1,788,489
HH-295	Power Center Moccasin Mach. Shop	Ferrero Electric Co.	9-22-58	11-13-58	5,414*	5,414*
HH-300A	Cherry Power Tunnel and Eleanor Diversion Tunnel	Guy F. Atkinson Co. The Arundel Corp. L. E. Dixon Company	12-2-57	-	8,136,420	4,649,923
HH-307	Transmission Line Clearing Moccasin to Cherry	H & M Construction Co.	2-24-58	2-1-59	97,775	27,930
HH-309	Restringing Moccasin-Newark Transmission Line	Sanders Electric Co.	6-23-58	3-31-59	115,855	116,720
HH-310	Erect Storage Building Miguel Meadows	H. H. Laughlin	8-4-58	9-11-58	3,966	3,966
HH-311	Transmission Tower Foundations & Erection-Moccasin to Cherry (Includes Install Item 2 below)	J. H. McFarland	7-21-58	4-6-59	405,604	478,934
HH-312	Const. Dormitory at Early Intake	Covington & Wolverton	1-26-59	6-15-59	100,941	103,576
HH-313	Canyon Powerhouse - Access Road	Harms & Thomas	9-1-58	10-24-58	60,702	66,693
HH-314	Transmission Line Clearing West of Moccasin	Heim Brothers	7-25-58	1-29-59	18,200	18,200
HH-315	Transmission Line Stringing Moccasin to Jones Point	Slater Electric Co.	1-4-59	6-10-59	490,518	490,518

(Cont'd)

TABLE 15 -(Cont'd)

HETCH HETCHY WATER SUPPLY & POWER SYSTEM

CONSTRUCTION CONTRACTS
FISCAL YEAR 1958-59

Contract No.	Description	Contractor	Contract Time Started	Contract Time Completed	Original Contract Price	Value of Work Done During Fiscal Year
HH-316	Construct Cherry Powerhouse (Includes Install Items 1, 3, 5 and part of 7, below)	Gunther & Shirley E. V. Lane Co. Harms & Thomas	10-13-58	-	$ 5,230,175	$ 1,794,141
HH-317	Furnish and install Crane Cherry Powerhouse	Moffett Engineering Co.	10-6-58	-	95,736	31,757
HH-318	Reroof 5 Cottages at Moccasin	W. E. Wickliffe	10-13-58	11-26-58	6,276	6,276
HH-320	Emergency Power Supply Priest Reservoir	Hetch Hetchy Bureau	9-22-58	11-4-58	5,893*	5,859*
HH-321	Seal Coat - Moccasin Streets	Beerman & Jones	5-25-59	6-3-59	6,720	6,642
HH-322	Relocate Power & Communication Line Moccasin	Slater Electric Co.	4-14-59	6-10-59	15,368*	14,868*
HH-325	Construct Transmission Line Moccasin to Station J (Includes Install Item 4 below)	J. M. King Co.	4-6-59	-	1,552,194	78,463
HH-326	Remove 22-kv Transmission Line Priest to Early Intake	Mahoney Electric Co.	5-25-59	-	8,653	-
HH-327	Recondition and Paint 25 Towers Moccasin-Newark Transmission Line	B. Reid Painting Service	5-4-59	7-3-59	13,125	13,125
HH-328	Replace 4-Inch Pipe Moccasin Water System	Hetch Hetchy Bureau	6-1-59	-	2,233	-
HH-329	Construct Warnerville Substation (Includes Install Item 6 and part of Item 7 below)	Stolte, Inc.	6-29-59	-	887,916	-

(Cont'd)

TABLE 15 -(Cont'd)

HETCH HETCHY WATER SUPPLY & POWER SYSTEM

CONSTRUCTION CONTRACTS

FISCAL YEAR 1958-59

Item No.	Purchase Order No.	Description	Contractor	Contract Time Started	Contract Time Completed	Original Contract Price	Value of Work Done During Fiscal Year
(1)	61996	Furnish & Deliver Hydraulic Turbines, Governors, Valves, etc., Cherry Powerhouse	Pelton Division Baldwin-Lima-Hamilton	10-15-57	-	$ 2,429,418(b)	$ 46,433
(2)	67041) 72408)	Transmission Tower Steel Moccasin to Early Intake	Bethlehem Pacific Coast Steel Company	12-17-57	9-12-58	366,646	406,312
(3)	85399	Steel Penstock Sections for Cherry Powerhouse	Southwest Welding & Mfg. Co.	6-26-58	-	1,694,900	1,224,174
(4)	93533	Transmission Tower Steel Moccasin to Station "J"	Bethlehem Pacific Coast Steel Company	9-19-58	-	436,414	27,927
(5)	3084	Power Transformers for Cherry Powerhouse	Allis-Chalmers Mfg. Co.	1-14-59	-	930,208(c)	-
(6)	3085	Power Transformers for Warnerville Substation	Allis-Chalmers Mfg. Co.	1-14-59	-	762,439(c)	-
(7)	13494	Oil Cir. Breakers for Warnerville Sub. and Cherry Powerhouse	Federal-Pacific Electric Company	5-1-59	-	1,118,731	-
		Total Amount of Hetch Hetchy Contract Construction Work Performed During Fiscal Year					$ 11,406,340

* Includes Material Furnished by City
(a) Includes 25% Reserve for Escalation
(b) Includes 20% Reserve for Escalation
(c) Includes 10% Reserve for Escalation

TABLE 16
SAN FRANCISCO INTERNATIONAL AIRPORT

CONSTRUCTION CONTRACTS
FISCAL YEAR 1958-59

Contract No.	Description	Contractor	Contract Time Started	Contract Time Completed	Original Contract Price	Value of Work Done During Fiscal Year
A-206	Construct Warm-Up Pads, etc.	L. C. Smith Co.	8-26-57	10-3-58	$ 377,396	$ 96,875
A-210	Construct Cir. Roads and Taxiways	L. C. Smith Co.	10-7-57	11-17-58	469,495	238,353
A-213	Fill for Runway Extensions	Piombo Constr. Co.	3-17-58	11-21-58	935,500	581,734
A-214	Fill for Extension of Runway 1-R	Piombo Constr. Co.	6-2-58	11-25-58	411,180	273,154
A-215	South Concourse and Pier E	Barrett Constr. Co.	5-26-58	4-29-59	760,700	716,914
A-216	Miscellaneous Steelwork (Informal)	E. J. Nelson	7-14-58	8-7-58	1,139	1,139
A-217	Extension to Pier B	Harrod & Williams	3-9-59	-	509,736	176,848
A-219	Sixth Floor Alteration - Term'l.Bldg.	Martinelli Constr. Co.	4-21-58	1-8-59	114,353	116,285
A-221	Fill for Plot #5	Piombo Constr. Co.	10-27-58	4-30-59	139,150	145,288
A-222	Misc. Improve. Sewage Treatment Plant	C. J. Collins Co.	7-14-58	10-1-58	4,516	4,516
A-223	Electric Bus Tie, Vaults "A" & "B"	Arvin Electric Co.	6-30-58	9-26-58	6,988	7,057
A-224	Alter. Communications Rm. Term'l.Bldg.	Wilco Constr. Co.	4-6-59	-	14,793	1,659
A-226	Construct Taxiway Shoulders	O. C. Jones & Son	12-1-58	-	167,750	141,049
A-227	Remodel Field Office, Old Term'l.Bldg.	Balliett Constr. Co.	6-30-58	8-28-58	4,998	5,237
A-228	Escalators - Terminal Building	Arntz Contracting Co.	1-5-59	-	157,766	147,717

(Cont'd)

TABLE 16 - (Cont'd)
SAN FRANCISCO INTERNATIONAL AIRPORT

CONSTRUCTION CONTRACTS
FISCAL YEAR 1958-59

Contract No.	Description	Contractor	Contract Time Started	Contract Time Completed	Original Contract Price	Value of Work Done During Fiscal Year
A-229	Fill for Plot #16	Piombo Constr. Co.	9-22-58	12-20-58	$ 144,960	$ 139,858
A-230	Drainage & Pavement for Road R-2	Fay Improvement Co.	8-25-58	11-4-58	51,233	47,494
A-231	De Aerator for Boiler Plant	E. A. Cornely Co.	11-10-58	5-14-59	8,696	8,696
A-234	Silt Removal, 1958-1	Jacobs Bros.	10-20-58	11-7-58	2,680	2,944
A-237	South Apron Water & Utility Exten.	Lowrie Paving Co.	12-12-58	2-6-59	17,850	16,766
A-238	Automatic Door Operators, Term'l.Bldg.	H. J. Drotleff & Son	1-5-59	-	58,648	52,926
A-240	Install Power Cables and Equipment North Field and Terminal Area	Coopman Electric Co.	1-12-59	4-27-59	76,316*	76,316*
	Total Amount of Airport Contract Construction Work Performed During Fiscal Year					$ 2,998,825

*Includes Material Furnished by City

TABLE 17
MUNICIPAL RAILWAY

CONSTRUCTION CONTRACTS
FISCAL YEAR 1958-59

Contract No.	Description	Contractor	Contract Time Started	Contract Time Completed	Original Contract Price	Value of Work Done During Fiscal Year
MR-448	Relocate Poles & Overhead on Market St. - 18th to Clayton	Coopman Electric Co.	6-17-57	8-12-58	$ 14,773*	$ 2,152*
MR-456	Construct Duct Line on Market St. - 18th to Clayton	Brayer Electric Co.	12-30-57	7-3-58	11,404	64
MR-457	Alter Trolley Coach Overhead One-Way Street - No. 30 Line	Coopman Electric Co.	5-5-58	12-14-58	57,666*	39,414*
MR-459	Construct Underground Duct and Install Feeders - Eleventh St.	Brayer Electric Co.	9-10-58	11-2-58	11,333	11,022
MR-461	Relocate Poles and Feeders Fifth & Mission Sts.	Coopman Electric Co.	7-14-58	8-12-58	6,542*	6,362*
	Total Amount of Municipal Railway Contract Construction Work Performed During Fiscal Year					$ 59,015

*Includes Material Furnished by City

CITY AND COUNTY OF SAN FRANCISCO

PUBLIC UTILITIES COMMISSION

ANNUAL REPORT

HETCH HETCHY WATER SUPPLY, POWER AND UTILITIES ENGINEERING BUREAU

AND

BUREAU OF LIGHT, HEAT AND POWER

FISCAL YEAR 1959-1960

H. E. LLOYD
GENERAL MANAGER AND CHIEF ENGINEER

CITY AND COUNTY OF SAN FRANCISCO

PUBLIC UTILITIES COMMISSION

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HETCH HETCHY WATER SUPPLY, POWER AND UTILITIES ENGINEERING BUREAU

AND

BUREAU OF LIGHT, HEAT AND POWER

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H. E. LLOYD
GENERAL MANAGER AND CHIEF ENGINEER

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AND
BUREAU OF LIGHT, HEAT AND POWER

ANNUAL REPORT

FISCAL YEAR 1959-60

I. INTRODUCTION

The Hetch Hetchy Water Supply, Power and Utilities Engineering Bureau and the Bureau of Light, Heat and Power are bureaus of the Public Utilities Commission of the City and County of San Francisco. The functions of these two bureaus are administered under one General Manager and Chief Engineer. Accordingly, this report covers the joint activities of the two bureaus for the fiscal year 1959-60.

The Hetch Hetchy Water Supply, Power and Utilities Engineering Bureau combines the functions of an operating department with those of an engineering bureau serving other operating departments of the Public Utilities Commission. In the first capacity it has full charge of the Hetch Hetchy water supply and electric power system, being responsible for its administration, planning, engineering, construction, operation and maintenance. In the second capacity it performs engineering work for the Airport Department and the Municipal Railway, including planning and supervising all new construction for those utilities and providing engineering service in connection with maintenance and reconstruction of the existing facilities.

The Bureau of Light, Heat and Power combines the functions of a service bureau to provide for furnishing utility services for municipal purposes with those of an operating bureau to provide for the lighting of public ways. In the first capacity it is responsible for arranging, under contracts, for the furnishing of electric, gas and steam services to municipal departments and for supervising the performance and checking of monthly billing under such contracts. In the second capacity the Bureau has jurisdiction over the general planning and improvements and has supervision of the operation and maintenance under contractual arrangements of the street lighting facilities within the City and County of San Francisco. By agreement with the Department of Public Works, the functions of all financing, design and construction of City-owned street lighting improvements are performed by that department subject to review and approval by the Public Utilities Commission through this Bureau.

The activities of the two bureaus during the fiscal year were financed and conducted under the following five budgets:

Division	No. of Positions	Total Amount Appropriated
Hetch Hetchy Project	121	$ 11,575,700
Utilities Engineering Bureau	159	1,400,500
Bureau of Light, Heat and Power	14	4,085,600
1955 Hetch Hetchy Power Bond Fund	----	13,095,000(a)
1956 Airport Bond Fund	----	3,413,000(a)
TOTAL	294	$ 32,253,000(b)

(a) Does not include funds previously appropriated for construction under way or completed during the fiscal year 1959-60.

(b) Excludes duplications due to budget transfers.

The total value of construction work performed under the direction of the Hetch Hetchy Water Supply, Power and Utilities Engineering Bureau during the fiscal year on the Hetch Hetchy Project, the San Francisco International Airport, and the Municipal Railway was approximately $13,700,000. At the close of the year an additional $3,200,000 of work was under construction.

II. HETCH HETCHY WATER SUPPLY AND POWER SYSTEM

Description

The Hetch Hetchy development is primarily a water supply project utilizing the precipitation and runoff of the upper Tuolumne River watershed, on the westerly slope of the Sierra Nevada Mountains, some 150 miles east of San Francisco Bay. This supply supplements local sources in San Mateo and southern Alameda counties for domestic water used by the City of San Francisco and its suburban customers.

Electric energy generated from the falling water is conveyed to San Francisco over transmission lines of the City and of the Pacific Gas and Electric Company under a wheeling agreement to supply all municipal needs including water supply pumping stations, airport, street railway, street lighting, public building lighting and miscellaneous other loads. In addition, electric energy is served to two irrigation districts in the San Joaquin Valley to supplement their own generating facilities and to two industrial customers in Santa Clara County. Load requirements in excess of the City's Hetch Hetchy generation are supplied by power and energy purchased from the Pacific Gas and Electric Company.

Revenue received from electric power sales and from the wholesale delivery of water to the San Francisco Water Department for further transmission and ultimate distribution and sale to consumers makes the Hetch Hetchy Project self-supporting.

The operating properties of the Hetch Hetchy water supply and power system are located in Tuolumne, Stanislaus, San Joaquin and Alameda Counties and include: Eight dams with appurtenant impounding and regulating reservoirs and diversion works; sixty miles of tunnels; ninety-five miles of aqueduct pipe lines; two powerhouses, at Moccasin and Early Intake; ninety-nine miles of 115,000-volt and thirty miles of 22,000-volt transmission lines; electric distribution, telephone and radio communication systems for project use; and appurtenant structures, maintenance and repair shops, and access roads.

The power system is being further expanded by current construction of the Canyon-Cherry Power Development financed from the 1955 Hetch Hetchy Power Bonds in the amount of $54,000,000. This expansion includes the addition of two new powerhouses (Cherry in 1960, Canyon in 1963), a 230,000-volt switchyard, a transmission substation, sixty miles of 230,000-volt and 115,000-volt transmission lines and appurtenant structures. The generating capacity of the enlarged system will be over three times that of the present system.

Revenue and Expenditures

Revenue received from the operation of the Hetch Hetchy Project is derived from two main sources:

1. Wholesale delivery of water to the San Francisco Water Department;

2. Sales of electric power and energy to San Francisco municipal departments, the Modesto and Turlock Irrigation Districts in the San Joaquin Valley, and two industrial customers located in Santa Clara County -- Permanente Cement Company and an aluminum foil plant operated by Kaiser Aluminum and Chemical Corporation.

Revenue received from the sale of water and for standby service to the San Francisco Water Department for the fiscal year 1959-60 was $4,500,000, the same amount as for the previous year.

Gross sales of electric energy during the year amounted to $6,593,000, compared to $5,379,000 during the previous year, an increase of 22.6 percent. Compared to last year, gross revenue from sales to the City's municipal departments increased 13 percent, and to the Irrigation Districts, 78.1 percent; whereas gross revenue from sales to the industrial customers decreased six percent. Part of the increase in revenue from sales for municipal uses reflected upward adjustment in rates to provide Hetch Hetchy power and energy for municipal purposes at cost. The large increase in sales to the Districts resulted from continuing rapid increase in the electrical demand in the area served by the Modesto and Turlock Irrigation Districts, combined with reduced generation at the Districts' Don Pedro power plant brought about by continuing adverse water conditions.

Revenue from other sources was $87,368, made up of service orders, rentals, meals, and other miscellaneous items.

Except for purchased power and taxes, expenditures under the various appropriations were in general kept well within budget estimates. Because of heavy bond interest and redemption costs, total expenditures for the year exceeded total gross revenue by $285,563, which amount was made up from unappropriated surplus.

Due to the large increases in electric demand, particularly by the Irrigation Districts, expenditures increased considerably for purchase of supplemental power and energy for resale. Power and energy for resale was purchased in the amount of $2,551,163, which was $271,163 over the original budget estimate, requiring a supplemental appropriation, and compared to $1,519,210 last year. There was also some increase in service charges for transmission and distribution of Hetch Hetchy power over the system of Pacific Gas and Electric Company. These charges amounted to $1,359,272, compared to $1,260,219 last year. Bond interest and redemption costs on outstanding Hetch Hetchy bonds amounted to $5,860,356 for the fiscal year 1959-60.

Taxes for the 1959-60 fiscal year on utility properties under the jurisdiction of the Hetch Hetchy Project located outside of San Francisco were paid in the following amounts:

Tax-Levying Body	Assessed Value	Taxes Paid
Alameda County	$ 4,450	$ 387.01
Mariposa County	70	2.88
San Joaquin County	4,950	298.26
San Mateo County	1,700	134.18
Stanislaus County	49,640	3,190.17
Tuolumne County	737,210 (a)	40,268.53 (b)
Banta-Carbona Irrigation District	3,192	127.68
Modesto Irrigation District	13,600	0 (c)
Oakdale Irrigation District	12,005	840.35
West Stanislaus Irrigation District	1,800	99.00
City of Redwood City	2,620	58.46
Total		$ 45,406.52

(a) Includes $500,000 assessment for water rights.
(b) Includes taxes on unsecured property.
(c) Tax rate for fiscal year 1959-60 set at 0.00.

For the fiscal year 1959-60 the Assessor of Tuolumne County placed an assessed valuation of $2,338,400 on the City's water rights for the Hetch Hetchy Project. The City requested a hearing before the State Board of Equalization in Sacramento, and on the second day of the hearing a compromise was reached in the form of a reduced valuation of $500,000. The assessed valuation was set at this amount without prejudice to either party.

Tables 1, 2 and 6 show comparative data on receipts, expenditures and sales of water and power in the operation of the Hetch Hetchy water supply and power system.

Water Production and Transmission

The precipitation on the Tuolumne River watershed for the fiscal year 1959-60 was subnormal for the second consecutive year. The seasonal total precipitation at O'Shaughnessy Dam was 26.10 inches compared to an average seasonal total of 33.82 inches for the past fifty-year period. Consequently, the total runoff on that portion of the mountain watershed supplying the City's reservoirs was approximately 65% of normal, and Hetch Hetchy Reservoir did not spill.

Because of the low runoff it was not necessary at any time during the year to releease water from any of the reservoirs for flood control, as provided under agreement with the Corps of Engineers, U. S. Army.

During the year, 58,378,000,000 gallons of water were diverted by the City from the Tuolumne River watershed through the Hetch Hetchy Aqueduct to the service area of the San Francisco Water Department. This makes a total of 550,670,000,000 gallons diverted since the Hetch Hetchy Aqueduct was placed in operation in 1934.

Table 3 shows comparative data on precipitation, runoff, storage, and delivery of the Hetch Hetchy water supply system.

Despite the relatively dry year, normal power production was maintained at Moccasin Powerhouse through effective planning and coordination with the Modesto and Turlock Irrigation Districts for maximum utilization of the available water. There was some curtailment of power production at the small Early Intake Powerhouse.

On March 6, 1960, water flowed through the recently completed Eleanor-Cherry Diversion Tunnel for the first time. The completion of this diversion tunnel during the critical water period was of substantial importance in conserving water from the Lake Eleanor watershed, and it will permit more effective utilization of the runoff of the Lake Lloyd and Lake Eleanor watersheds in the future.

An agreement was entered into between the United States Atomic Energy Commission and the City and County of San Francisco under which the City will supply water at Mocho Shaft of the Hetch Hetchy Aqueduct for use at the Lawrence Radiation Laboratory at Livermore, California. The Commission will install, at its expense, pumps, pipelines and all necessary facilities to transport water to the site and will pay the established rates of the San Francisco Public Utilities Commission for water supplied. The contract cost to install pumps and pipelines is in excess of $400,000.

A study of the Hetch Hetchy Aqueduct was made to determine the most practical way of increasing its capacity for transmission of water to the San Francisco Bay Area. It was determined that it is feasible to increase the pressure on the existing coast range tunnel by installing a third pipeline across the San Joaquin Valley to provide a capacity of 290,000,000 gallons daily. The present capacity of 160,000,000 gallons daily has been utilized continuously since April, 1959, due to subnormal precipitation and increased demand. The estimated cost of this improvement is $22,000,000.

In December, 1959, a water velocity test was conducted on the Moccasin Powerhouse penstocks under supervision of the Alden Hydraulic Laboratory, Worcester Polytechnic Institute, Massachusetts. The purpose of the test was to obtain data from which the capacity of the Mountain Tunnel under various operating conditions could be determined. The data will be used in connection with the design of the Canyon Powerhouse. The information obtained will also serve to determine the present efficiency of the Moccasin Powerhouse generating units.

Power System Operation

Operation of the City's hydroelectric power plant at Moccasin continued normal throughout the year, but continuing adverse water conditions made it necessary to curtail generation at Early Intake Powerhouse. Throughout July and August it was necessary to release water stored in Lake Lloyd in order to meet the requirements of the Modesto and Turlock Irrigation Districts. As a consequence, generation at Early Intake was subsequently limited to one generator, as compared to three generators operating under normal conditions. Heavy storms in mid-September permitted resumption of full generation, but during December, January and February, 1960, it again became necessary to curtail generation at Early Intake Powerhouse.

During the year, due to the curtailment in generation noted above and the increased demand by the City's customers, the Hetch Hetchy system purchased approximately 384,500,000 kilowatt-hours of energy to supplement the generation of its own plants. The principal factor was a marked increase in consumption of the Modesto and Turlock Irrigation Districts, which purchased over 431,200,000 kilowatthours of energy during the fiscal year 1959-60, an increase of 67 percent over the previous fiscal year. This resulted from more than average load growth in the Districts' service area combined with reduced generation at the Districts' Don Pedro power plant, which was made necessary by continuing adverse water conditions.

Tables 4 to 7, inclusive, show comparative operating statistics for the Hetch Hetchy power system.

Emergency repairs were performed during the year on two generator field coils at Moccasin Powerhouse. On this occasion inspection revealed that the insulation has deteriorated to some extent since the original installation in 1925. For this reason it may be necessary to include provision for re-insulating the generator field circuits in planning for future reconstruction work at Moccasin Powerhouse.

Power Agreements

Progress was made during the year in the negotiation of agreements relative to the disposal of the additional power which will be available when the new Cherry Powerhouse is placed in service. In addition, it is proposed to enter into new agreements for the sale and purchase of electric power with the Modesto and Turlock Irrigation Districts to take the place of an existing single agreement between the City and the Districts which expires in 1962. The new agreements are intended to become effective when the City's Cherry Powerhouse begins operation and will reflect an adjustment in rates and charges in line with present-day costs. It is anticipated that all necessary contract arrangements will be completed by August, 1960.

Power Rates

Effective July 1, 1959, billings to City departments were made subject to a uniform discount calculated to provide Hetch Hetchy power and energy for municipal purposes at cost. The discount amounts to 16.4 percent and is based on a determination of cost made by Mr. R. A. Wehe, rate consultant, as set forth in a report entitled "Cost and Rate Analysis, Hetch Hetchy Water and Power Division," submitted to the Public Utilities Commission on September 30, 1958.

The Wehe study also made a determination of the cost to serve the San Francisco International Airport with bulk power for resale by the Airport Department to its tenants. It was found that a discount of 1.7 percent applied to billings for this portion of the Airport's load would permit recovery of cost. Accordingly, it was made effective beginning July 1, 1959, with the result that the Airport receives a discount of 1.7 percent on billings for resale energy, and, in common with the other City departments, a discount of 16.4 percent on billings for its own departmental usage.

Improvements

Due to the sale of bonds during the past several years for the construction of the $54,000,000 Canyon-Cherry Power Development, total annual bond interest and redemption costs on outstanding Hetch Hetchy bonds have increased considerably. Consequently, major additions and replacements to the operating properties were deferred during the year until such time as the increase in power revenue from the operation of the new Cherry Powerhouse will provide sufficient funds.

During the fiscal year the following improvements to the operating properties of the Hetch Hetchy Project were completed:

An electronic water sterilizer was installed for the treatment of the domestic water supply at O'Shaughnessy Dam. This installation will safeguard the health of employees of the City and the National Park Service and the general public who use this local water supply.

Obsolete electrolytic arresters for protecting the Moccasin Powerhouse generator field circuits from overvoltage were replaced with modern type discharge varistors.

In preparation for the start of construction of the Canyon Power Project, the second stage of the Canyon-Cherry Power Development, the surface of the Mather Road from the top of the Early Intake Hill to Mather, a distance of approximately nine miles, was reconstructed and paved.

A fence was constructed around an area at Miguel Meadows, between Hetch Hetchy Reservoir and Lake Eleanor for use as a horse pasture and corral. Pack horses are confined at this location when used for repairing and winter-stocking cabins along the snow survey course.

Canyon-Cherry Power Development

The $54,000,000 Hetch Hetchy power bond issue approved by the electorate of San Francisco in November, 1955, authorized the construction of two hydroelectric power plants as additions to the Hetch Hetchy power system.

The first plant, designated as the Cherry Power Project, under construction during the year, will utilize the water stored in Lake Eleanor and behind the recently completed Cherry Valley Dam. The water will be conveyed through a pressure tunnel six miles long to a point on the Cherry River near its confluence with the Tuolumne River. At this point the water will drop approximately 2,400 feet to the powerhouse to supply two generators having a combined nameplate capacity of 135,000 kilowatts. Cherry Powerhouse is scheduled to be in operation in the fall of 1960.

The second plant, the Canyon Power Project, will develop the power drop between O'Shaughnessy Dam and Early Intake Diversion Dam. At present the water released from O'Shaughnessy Dam flows down the natural stream bed of the Tuolumne River to Early Intake, where it is diverted through nineteen miles of tunnel to Moccasin Powerhouse. By the construction of eleven miles of a new pressure tunnel between O'Shaughnessy Dam and Early Intake a power drop of approximately 1,370 feet can be realized. It is estimated that the combined nameplate capacity of the two generators in this powerhouse will be 67,500 kilowatts. Construction of the Canyon Power Project is scheduled to be completed in 1963.

These two powerhouses will be located about three miles apart and will have a common switchyard at Early Intake. From the switchyard a new 230,000-volt double circuit transmission line will connect to a new transmission substation (Warnerville) near Oakdale, approximately fifty miles westerly. This substation will step down the voltage from 230,000 volts to 115,000 volts for delivery of power over a double circuit transmission line extending another twelve miles to serve the Modesto and Turlock Irrigation Districts. The substation will also provide a connection with the system of the Pacific Gas and Electric Company for emergency standby service.

At the end of the fiscal year construction work was nearing completion on the first stage of the Canyon-Cherry Power Development, which includes the Cherry Power Project and the joint switchyard, transmission and substation facilities of the Cherry and the future Canyon Power Project. The total cost of the first stage, including engineering, will approximate $30,000,000.

During the year construction of the Eleanor-Cherry Diversion Tunnel and the Cherry Power Tunnel was completed. The power tunnel was flushed out and on June 24, 1960, was subjected to full reservoir pressure with no apparant leakage.

The Cherry Powerhouse penstock also was completed, and filling of the penstock was commenced on June 28. It was subsequently filled and subjected to full reservoir pressure of approximately 1,000 pounds per square inch at the powerhouse. Initial leaks at some dresser couplings were corrected, and the penstock is ready for operation.

Installation of major equipment in Cherry Powerhouse was practically complete at the end of the year. The auxiliary services and controls were being checked preparatory to making the first mechanical run-in of generator and turbine Unit No. 1. This unit will be available for power generation the early part of August, 1960, and will be followed by Unit No. 2 about a month later.

Construction of the new 230,000-volt and 115,000-volt transmission lines from Cherry Powerhouse to Modesto Substation J, together with the associated switchyard at Early Intake and transmission substation at Warnerville, is complete except for final connections, adjustments and checking. The final connections will be to the systems of Modesto Irrigation District at Substation J, the Turlock Irrigation District at Oakdale Substation, and Pacific Gas and Electric Company at Warnerville Substation.

Engineering work was continued on the Canyon Power Project by both the Bureau's staff and that of Sverdrup and Parcel, Inc., who are furnishing under contract engineering services for the Canyon-Cherry Power Development.

Status of Hetch Hetchy Contracts

A summary of Hetch Hetchy construction contracts, including work on the Canyon-Cherry Power Development, in progress during the fiscal year 1959-60 is shown in Table 15.

New Don Pedro Dam

Under agreements for the development of the Tuolumne River watershed on a cooperative basis studies are being continued by the City of San Francisco, the Modesto and Turlock Irrigation Districts, and the Corps of Engineers, U. S. Army, for the development of additional storage capacity by the construction of a new dam on the Tuolumne River about a half mile downstream from the Districts' present Don Pedro Dam. This project, as proposed, will provide necessary additional storage space for the City in lieu of constructing more expensive storage facilities in the upper watershed, additional storage space and facilities for irrigation and power generation for the Irrigation Districts, and additional flood control space for the Corps of Engineers in its program for protection of the lower Tuolumne River from flood damage.

To accomplish these purposes it is proposed to construct the new dam with a reservoir capacity of not less than 1,200,000 acre-feet, over four times the size of the present one. The two Irrigation Districts will furnish the damsite, which they now own, and the lands which will be covered by the new reservoir. The City of San Francisco will supply an estimated $45,000,000, and the Federal Government will supply an estimated $3,000,000 toward the cost of the dam. The Federal portion may be adjusted upward following reevaluation of flood control benefits. This upward adjustment would correspondingly reduce the City's portion. For these expenditures, the City will

acquire 570,000 acre-feet of storage space, and the Government will secure 340,000 acre-feet of flood storage space. Such portion of the latter space which is not reserved for flood control at any time will be available for conservation storage, fifty percent each to the City and the Districts. This will result in maximum possible storage space of 740,000 acre-feet available to the City in the new reservoir, which will assure a dependable water supply for ultimate diversion of an estimated 400,000,000 gallons daily to the Bay Area for domestic purposes, and which will safeguard the City's power revenues by assuring full capacity operation of its power plants.

Civil Defense Activities

All of the operating properties of the Hetch Hetchy water supply and power system are located outside the San Francisco Bay Area. Civil defense planning of the Bureau, therefore, is confined principally to providing information and establishing procedures which will serve as a guide to officials of various agencies and to Hetch Hetchy employees for performing the following functions during a state of emergency or disaster:

1. Operation of the water supply system of the Hetch Hetchy Project in accordance with the requirements of the San Francisco Water Department;

2. Operation of the electric generating and transmission system of the Hetch Hetchy Project in coordination with those of the Pacific Gas and Electric Company, the Modesto Irrigation District, and the Turlock Irrigation District;

3. Emergency repairs to essential facilities, as may be required;

4. Protection of properties against espionage and sabotage.

Along with other electric utilities, the Bureau participated on May 3 - 5, 1960, in "Operation Alert - 1960," the seventh annual nationwide civil defense exercise. So far as the utilities were concerned, emphasis this year was focused on anticipated bomb damage, estimated loss of manpower, computation of predicted fallout, and communications. In cooperation with the United States Department of Interior and the local Area Power Director, the Bureau completed and forwarded the "Action Record" for the Hetch Hetchy power system.

In June, 1960, the annual "Industrial Defense Survey" of the facilities of the Hetch Hetchy Project was conducted by the Provost Marshal Section, Headquarters, Sixth U. S. Army. Other than several minor recommendations, the confidential report indicated that the findings were satisfactory.

During the year the first stage of a two-year program of microfilming vital engineering records was completed. This includes records of dates subsequent to the previous microfilming work performed in 1943. Approximately 3,500 drawings were reproduced on 105-millimeter film for safekeeping with two four-inch by six-inch contact prints of each for index and reference purposes.

III. AIRPORT ENGINEERING AND CONSTRUCTION

General

The program for improvements to the San Francisco International Airport under the $25,000,000 Airport Bonds approved by the electorate in November, 1956, is well-advanced in planning, design and construction. Both in the terminal area and in the landing field areas, the effects of construction have been noticeable as the Airport facilities were expanded during the fiscal year to meet the requirements of additional traffic of the "jet age." The major items of work accomplished are described below.

Construction Progress

The value of construction work at the Airport during the fiscal year under the direction of the Bureau totaled approximately $3,000,000, of which $900,000 was for buildings, $400,000 was for roads and maintenance base improvements, and $1,700,000 was for landing field improvements.

The paving and related drainage and electrical work were completed for the extensions of Runway 1R-19L to 9,000 feet, Runway 10R-28L to 7,150 feet, and Runway 10L-28R to 9,500 feet. These runway extensions were placed in operation at the close of the 1959 construction season.

A major project of taxiway and runway reconstruction was completed with minimum interference to aircraft operations. With the reconstruction of the taxiways the paved shoulders were widened to prevent ingestion of extraneous materials by jet engines. A contract for additional apron paving adjacent to Piers B and E was essentially complete, and the areas were available for use at the close of the fiscal year. Plans and specifications were completed and the contract advertised for an additional reconstruction project for Runway 1R-19L and adjoining taxiways.

An improvement in Airport roadways was made by the completion of Road R-3, which joins the Airport Terminal area to the northerly maintenance base areas and San Bruno Avenue. The work of improving and landscaping the main entrance roadway to the Airport was essentially complete with only minor items of work remaining.

In the Terminal Building area Pier B was extended. This extension increased by five the number of jet plane parking positions. In addition to this improvement, projects for enlargement of the lobby floor restrooms and additional ticket counter and baggage facilities were well under way. Plans and specifications for improvements to the fourth floor of the Terminal Building and ground floor of Pier D were completed, and at the end of the year work was ready to start.

The capacity of the Airport cargo handling facilities was increased considerably by the addition of two Cargo Buildings and their related apron, roadway and utility enlargements.

The contract for fill for extension of Runway 1R-19L 500 feet bayward and fill for maintenance base areas was just starting at the close of the fiscal year.

Status of Airport Contracts

A summary of the Airport Construction contracts in progress during the fiscal year 1959-60 is shown in Table 16.

Planning for Future Work

A master plan for the Airport prepared by this Bureau was approved by the Public Utilities Commission. This plan is based on studies using the latest available jet aircraft operating data and technical information received from the District Airport Engineer, Federal Aviation Agency, and others.

Plans and specifications were nearing completion for improvements to the North Concourse and a portion of Pier B of the Terminal Building. The Bureau is coordinating the work of the consultants working on plans for the New South Terminal Building. These include the architects, the traffic engineers, and the soils engineers. In order to improve the automobile parking situation plans and specifications were completed for adding a temporary parking lot with a capacity of 800 vehicles.

Preliminary plans were under way at the close of the fiscal year for the extension of Runway 28L 2,370 feet bayward.

Financing

Under the $25,000,000 1956 Airport Bond program a total of $6,018,000 in construction contracts has been awarded to date. Also during the year funds from Airport revenue were appropriated in the amounts of $14,000 for silt removal from drainage canals and $220,000 for reconstruction of the runway lighting system.

During the year the Federal government through the Federal Aviation Agency allocated to the City $2,382,022 for subventions and through the United States Public Health Service allocated $33,000 for enlargements to the Sewage Treatment Plant. Funds received during the year from the Federal Aviation Agency for construction work completed under approved grants totaled $1,139,000.

Property Acquisition and Sale

One large parcel of submerged land required for Airport expansion was acquired during the year. This parcel consisted of 1,220 acres and was purchased at $125 per acre for a total of $152,500.

One parcel of surplus property consisting of several lots in Millbrae, which were purchased by the City for $900 in 1947, was sold by the Director of Property for $19,000.

Taxes

The total area, total assessed value, and total taxes paid for Airport property for the fiscal year 1959-60, compared to the previous two years, are as follows:

	1957-58	1958-59	1959-60
Area (acres)	3,345.06	3,345.06	4,565.06
Assessed value	$ 1,164,786	$ 1,164,786	$ 1,182,330
Taxes paid	$ 74,008	$ 81,269	$ 88,354

IV. MUNICIPAL RAILWAY ENGINEERING AND CONSTRUCTION

General

Work continued on the design and preparation of plans and specifications for routine rehabilitation of the Municipal Railway properties. In addition, plans were prepared for changes to the facilities made necessary by the State's Freeway construction program.

The construction work carried on during the fiscal year was financed from the Municipal Railway Operating Fund, the Municipal Railway Reconstruction and Replacement Fund, and by the State of California.

Projects started or completed during the fiscal year are described generally below.

Overhead Construction

Construction of a portion of the Central Freeway by the State required the rearrangement of trolley coach overhead feeders and lines, which work was completed on November 30, 1959.

Plans and specifications for the temporary relocation of trolley coach overhead feeders and lines required for construction of a portion of the Southern Freeway at Mission Viaduct have been prepared. This temporary relocation will be constructed during the next fiscal year.

Track Paving Reconstruction

The removal of basalt paving blocks and replacement with concrete pavement on California Street from Van Ness Avenue to Mason Street was completed on August 12, 1959. Plans and specifications for similar work on California Street from Mason Street to Drumm Street have been prepared. This work will start early in the next fiscal year.

Buildings and Structures

Construction of waiting shelters and balustrade wall at the East Portal of the Twin Peaks Tunnel was completed on December 3, 1959. The work of repairs and painting at the East Portal of the tunnel is now in progress and will be completed early in the next fiscal year.

Plans and specifications for the alterations to Washington-Mason carhouse have been prepared. This work will start early next year.

Status of Municipal Railway Contracts

A summary of the Municipal Railway construction contracts in progress during the fiscal year 1959-1960 is shown in Table 17.

Rapid Transit

In May, 1959, the Board of Supervisors appropriated the sum of $125,000 for the purpose of conducting a transit study in coordination with the survey to be undertaken by the Bay Area Rapid Transit District. This study was conducted under the direction of the Utilities Engineering Bureau, with assistance from the City Planning Department, Municipal Railway, Department of Public Works and the Parking Authority. General policy guidance was provided by the Mayor's Transportation Council. The final report, "A Plan for Rapid Transit in San Francisco Consonant with the Bay Area Rapid Transit System," was transmitted to the Mayor, the Board of Supervisors, and the Mayor's Transportation Council in June, 1960.

One of the features of this study was a cordon count of all vehicles and pedestrians entering and leaving the Metropolitan Traffic District during the twelve-hour period from 7 a.m. to 7 p.m. on a typical weekday. This count was carried out by the personnel of the Utilities Engineering Bureau, Municipal Railway and the Department of Public Works. The last such cordon count was made in 1947.

Numerous conferences were held during the year with the staff and the consultants of the Bay Area Rapid Transit District to discuss mutual problems and to attempt to iron out differences of opinion on the operating features and routes.

V. STREET LIGHTING

General

The lighting of public streets within the City and County of San Francisco is provided by City-owned facilities, by facilities furnished under an annual contract with the Pacific Gas and Electric Company, and by jointly-owned facilities of the City and the Company.

During the fiscal year 1959-60 maintenance and repair of City-owned installations were performed under contract and included group and individual lamp replacements, glassware replacement, painting, repair of defective and damaged equipment, and miscellaneous work. Under another contract the Pacific Gas and Electric Company furnished street lighting service including maintenance of equipment, switching and control of street lighting circuits, and emergency work as required. Electric energy for all street lighting operation within the City is supplied from the City's Hetch Hetchy power system.

Studies were continued on the planning of overall requirements for illumination of public ways. Detail planning and design for changes, improvements and additions to City-owned facilities in connection with street improvement projects were performed by the Bureau of Engineering of the Department of Public Works. Final plans are subject to approval of the Public Utilities Commission through this Bureau.

Operation and Maintenance

On June 30, 1960, the total number of City-owned and Company-owned street lights in service in public streets, parks, viaducts, tunnels, and underpasses was 28,830, an increase during the year of 238. Table 11 shows a summary of the number and type.

During the fiscal year 1959-60 a total of $1,009,914 was expended for the operation, maintenance and repair of the street lighting system in San Francisco, an average of approximately $35.03 per unit. Of the total expenditure, $11,378 was paid by the State from gas tax funds, which payment covered half the cost of operation and maintenance of street lighting at intersections on City streets which are part of the State highway system. A summary of expenditures for the fiscal year is shown in Table 12.

Improvements

New City-owned installations were completed during the year at a cost of $150,325 and were financed principally by the Department of Public Works under street improvement programs. A summary of these improvements is shown in Table 13.

Complaints and Damages

During the year 124 complaints and requests for service in connection with street lighting operations were investigated and acted upon. These involved inadequate illumination, objectionable glare in windows, and requests from property owners for relocation of street lighting poles.

Also during the year there were 51 accidents involving damage to City-owned street lighting property. In each case investigation was made as soon as possible to ensure removal of public hazards and obstructions to traffic, and efforts were made to secure reimbursement for the cost of repairs from the person responsible for the damage. Total street lighting damage claims during the year amounted to $23,156, and collections amounted to $14,529.

VI. UTILITY SERVICES TO MUNICIPAL DEPARTMENTS

General

Electric energy supplied to municipal departments is generated by the City's Hetch Hetchy power system and is delivered to the various service points by means of the transmission and distribution facilities of the Pacific Gas and Electric Company under a wheeling contract. The natural gas and steam supplied to municipal departments are furnished by the Pacific Gas and Electric Company under the provisions of its annual contract with the Bureau.

Municipal Consumption of Electricity, Gas and Steam

During the fiscal year 1959-60 a total of 252,584,748 kilowatt-hours of electricity was supplied through 840 accounts for municipal uses, including street lighting and traffic devices. Payment for electricity by the City departments in the total amount of $2,922,785 was made through the Bureau to the Hetch Hetchy Project. At the same time a total of 12,094,930 hundred-cubic-feet of natural gas was consumed through 551 accounts, and a total of 1,556,000 pounds of steam was consumed through one account, for which the Pacific Gas and Electric Company was paid a total of $665,436 and $2,960, respectively. A summary of the consumption and expenditures for these commodities supplied to each municipal department is shown in Tables 9 and 10.

San Francisco International Airport

The Bureau renders service to the San Francisco International Airport in the operation of the City-owned electric distribution system within the Airport boundary. This service includes supervising the installation and testing of the associated metering facilities, performing the necessary monthly meter readings, and preparing the corresponding billings for presentation by the Airport Department to the private tenants. During the fiscal year 71 tenants were supplied a total of 45,876,376 kilowatt-hours of electricity through 137 metered and 66 unmetered accounts, for which the Airport Department collected $580,770.

TABLE 1.
HETCH HETCHY WATER SUPPLY & POWER SYSTEM

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES (INCLUDING ENCUMBRANCES)
FISCAL YEAR 1959-1960

OE	Description	Budget	Actual	-Under, Over
110	Permanent Salaries	$ 362,954	$ 349,186	$ -13,768
111	Allowance for Overtime	1,463	1,763	300
112	Allowance for Holidays	7,600	7,396	-204
113	Extended Work Week	9,558	8,896	-662
120	Temporary Salaries	18,552	16,730	-1,822
130	Wages (Net Appropriation)	437,206	423,146	-14,060
130	Wages (Gardeners)	19,097	18,652	-445
	Subtotal (Personal Services)	856,430	825,769	-30,661
200	Contractual Service	13,828	10,427	-3,401
216	Maint. & Repair of Auto. Equip.	33,000	32,265	-735
231.0	Heat, Light & Power	485	526	41
231.1	Purchase of Power for Resale	2,280,000	2,551,163	271,163
231.2	Service Charge for Transm.& Dist.	1,427,000	1,359,272	-67,728
251	Subsistence of Employees	18,000	14,685	-3,315
266	Assessment of Properties	-0-	5,250	5,250
269	Maintenance of Radio System	5,250	5,279	29
270	Printing & Examination of Bonds	-0-	2,867	2,867
284	Subsistence of Official Visitors	2,500	2,415	-85
300	Material and Supplies	49,905	54,465	4,560
350	Foodstuffs	17,000	9,407	-7,593
640	Water Rights and Damage Claims	19,000	17,456	-1,544
641	Hydrography	23,780	23,661	-119
801	Accident Compensation	6,000	5,567	-433
804	Injuries and Damages	-0-	166	166
812	Fidelity Insurance	33	33	-0-
813	Automobile Insurance	3,500	3,510	10
814	Fire Insurance	5,400	5,370	-30
815	Miscellaneous Insurance	10,000	9,760	-240
854	Membership Dues	61	36	-25
855	Fee to U.S. Gov't-Raker Act	30,000	30,000	-0-
856	Maint. of Roads & Trails-Raker Act	25,000	3,627	-21,373
860	Retirement Allowance	107,555	103,021	-4,534
865	Health Service System	4,364	5,079	715
870	Taxes	26,778	45,407	18,629
880	Rentals - Transmission Lines	54,000	54,000	-0-
900	Services of Other Depts.	405,230	380,312	-24,918
	TOTAL OPERATION & MAINTENANCE	5,424,099	5,560,795	136,696
400	Equipment	13,605	12,967	-638
756	Reconstruction & Replacement	-0-	-0-	-0-
757	Additions and Betterments	32,000	32,000*	-0-
800	Bond Interest & Redemption	6,105,948	5,860,356	-245,592
	TOTAL MISCELLANEOUS	6,151,553	5,905,323	-246,230
	GRAND TOTAL	$11,575,652	$11,466,118	$-109,534

* Unexpended balance transferred to unallocated balance of appropriation.

TABLE 2
HETCH HETCHY WATER SUPPLY & POWER SYSTEM

SUMMARY OF RECEIPTS & EXPENDITURES
FISCAL YEAR 1959-1960

RECEIPTS	BUDGET	ACTUAL	-UNDER OVER
Revenue from Sale of Electric Energy	$6,560,200	$6,593,187	$ 32,987
Revenue from Sale of Water and Standby Charge, S.F.W.D.	4,500,000	4,500,000	-0-
Other Revenue	65,000	87,368	22,368
TOTAL GROSS REVENUE	$11,125,200	$11,180,555	$ 55,355
Receipts from Unappropriated Surplus	450,452	450,452	-0-
TOTAL REVENUE AND SURPLUS	$11,575,652	$11,631,007	$ 55,355
EXPENDITURES			
Total Expenditures (from Table 1)	$11,575,652	$11,466,118	-$109,534
EXCESS OF REVENUE & SURPLUS OVER EXPENDITURES	-0-	$ 164,889	$ 164,889

COMPARISON OF REVENUE AND EXPENDITURES

Total Gross Revenue	$11,180,555
Total Expenditures	11,466,118
Excess of Expenditures over Gross Revenue	$ 285,563

TABLE 3
HETCH HETCHY WATER SUPPLY

PRECIPITATION, RUNOFF, STORAGE AND DELIVERY
AS OF JUNE 30 BY FISCAL YEARS

SEASON PRECIPITATION (INCHES)	Normal	1955-56	1956-57	1957-58	1958-59	1959-60
Hetch Hetchy	33.82	52.23	29.09	44.37	24.41	26.10
Lake Lloyd	-	69.44	39.98	59.02	29.77	39.32
Approx.percent of Normal		154%	86%	131%	72%	77%
WATERSHED RUNOFF (ACRE-FT.) (a)						
Hetch Hetchy	723,100	1,263,881	641,776	988,864	423,656	451,700 (b)
Lake Lloyd	263,300	450,437	242,037	370,010	189,230	225,900 (b)
Lake Eleanor	157,900	250,276	140,652	227,775	100,884	61,700 (b)
Total	1,144,300	1,964,594	1,024,465	1,586,649	713,770	739,300 (b)
Approx. percent of Normal		172%	90%	139%	62%	65%
RESERVOIR STORAGE (ACRE-FT.)	No-Spill Capacity					
Hetch Hetchy	360,300	347,040	361,746	341,606	315,258	297,730
Lake Lloyd	268,200	185,985	268,236	264,372	80,792 (c)	124,868
Lake Eleanor	26,200	24,472	16,280	23,634	4,198 (c)	11,414 (d)
Total	654,700	557,497	646,258	629,612	400,248	434,012
DELIVERY TO S.F.W.D. (ACRE.FT.)						
Average per day		263	299	249	316	489
Maximum per day		392	414	420	493	502
Total for fiscal year		96,478	108,959	90,709	115,398	179,154
Total since operation of Hetch Hetchy Aqueduct began in 1934.						1,689,918

Notes:
(a) For Water Year, November 1 to October 31.
(b) Estimated.
(c) Drawn down to permit construction of Eleanor-Cherry Diversion Tunnel.
(d) Water was diverted from Lake Eleanor to Lake Lloyd starting March 6, 1960.
(e) One acre-foot equals 325,900 gallons or approximately 1/3 million gallons.

TABLE 4

HETCH HETCHY POWER SYSTEM

ELECTRIC ENERGY GENERATED, PURCHASED AND DISTRIBUTED

FISCAL YEAR 1959-60

PLANT DATA	Capacity (Kilowatts) Rated	Short Time	Annual Load Factor - %
Moccasin Powerhouse	70,000	82,000	72.3
Early Intake Powerhouse	3,600	3,900	52.5
Total	73,600	85,900*	71.4

ENERGY GENERATED AND PURCHASED (KILOWATT-HOURS)		
Gross Generation		
Moccasin Powerhouse	520,114,000	
Early Intake Powerhouse	17,996,200	538,110,200
Station Service		
Moccasin Powerhouse	855,600	
Early Intake Powerhouse	45,169	900,769
Net Generation		537,209,431
Purchased from P. G. & E. Co.		384,528,298
Total Available		921,737,729

ENERGY DISTRIBUTED (KILOWATT-HOURS)	
Project Use	3,246,239
Sales	
Municipal Accounts	252,584,748
Modesto Irrigation District	300,501,600
Turlock Irrigation District	130,742,402
Permanente Cement Company	152,045,469
Kaiser Aluminum & Chemical Corporation	13,272,000
Miscellaneous Customers	4,197,071
Pacific Gas and Electric Company (Dump)	0
Losses and Unaccounted For	
Hetch Hetchy System	19,161,319
P.G.&E. System (Municipal, Permanente & Kaiser Accounts)	45,986,881
Total	921,737,729

*Coincidental Demand

TABLE 5
HETCH HETCHY POWER SYSTEM

COMPARATIVE ELECTRIC ENERGY CONSUMPTION BY CUSTOMERS
FISCAL YEARS 1959-60 AND 1958-59

(Nearest 100,000 Kilowatt-Hours)

CUSTOMER	1959-60 Kilowatt Hours	1958-59 Kilowatt-Hours
Municipal Accounts:		
Street Lighting	35,700,000	35,300,000
Public Works	18,000,000	18,100,000
S. F. International Airport	53,700,000	43,000,000
Municipal Railway	66,700,000	64,700,000
Water Department	37,500,000	35,600,000
S. F. Unified School District	14,900,000	14,300,000
Other City Departments	26,100,000	24,600,000
Modesto Irrigation District	300,500,000	192,100,000
Turlock Irrigation District	130,700,000	66,000,000
Permanente Cement Company	152,000,000	166,600,000
Kaiser Aluminum & Chemical Corp.	13,300,000	12,000,000
All Other Sales	4,200,000	6,600,000
TOTAL	853,300,000	678,900,000

TABLE 6
HETCH HETCHY POWER SYSTEM

COMPARATIVE GROSS REVENUE RECEIVED FROM SALE OF ELECTRIC ENERGY
FISCAL YEARS 1959-60 AND 1958-59

(Nearest $1,000)

CUSTOMER	1959-60	1958-59
Municipal Accounts:		
Street Lighting	$ 480,000	$ 475,000
Public Works	244,000	238,000
S. F. International Airport	478,000	334,000
Municipal Railway	714,000	600,000
Water Department	320,000	297,000
S. F. Unified School District	279,000	263,000
Other City Departments	408,000	380,000
Modesto Irrigation District	1,578,000	965,000
Turlock Irrigation District	659,000	291,000
Permanente Cement Company	1,290,000	1,380,000
Kaiser Aluminum & Chemical Corp.	84,000	82,000
All Other Sales	59,000	74,000
TOTAL	$6,593,000	$5,379,000

TABLE 7
HETCH HETCHY POWER SYSTEM

ELECTRIC ENERGY GENERATED, PURCHASED AND DISTRIBUTED BY FISCAL YEARS - KILOWATTHOURS

NET GENERATION	1954-55	1955-56	1956-57	1957-58	1958-59	1959-60
Moccasin Powerhouse	507,019,400	524,676,600	523,844,600	522,575,450	527,023,100	519,258,400
Early Intake Powerhouse	24,537,700	25,078,500	32,497,900	32,690,647	27,876,552	17,951,031
Total	531,557,100	549,755,100	556,342,500	555,266,097	554,899,652	537,209,431
PURCHASE (P.G.&E. CO.)	118,156,156	84,435,056	139,552,972	135,797,585	202,433,126	384,528,298
TOTAL	649,713,256	634,190,156	695,895,472	691,063,682	757,332,778	921,737,729
PROJECT USE	3,025,555	2,938,389	3,322,249	3,439,500	3,007,776	3,246,239
SALES						
Municipal Accounts	206,929,143	214,040,036	219,993,788	220,814,868	235,557,361	252,584,748
Modesto Irrig. Dist.	203,364,000*	176,712,000*	219,024,000*	179,601,000	192,134,400	300,501,600
Turlock Irrig. Dist.	-	-	-	36,621,604	66,007,346	130,742,402
Permanente Cement Co.	141,889,000	139,566,100	156,069,290	156,458,000	166,572,310	152,045,469
Kaiser Aluminum Corp.	12,168,000	14,496,000	16,128,000	14,616,000	12,000,000	13,272,000
Riverbank Ord. Plant	7,647,460	6,890,130	7,130,385	4,587,573	-	-
Miscellaneous Customers	7,561,315	3,319,315	633,767	2,528,934	6,585,970	4,197,071
P.G.&E. Co. (Dump)	1,394,334	7,111,058	0	97,296	0	0
LOSSES & UNACCOUNTED FOR	65,734,449	69,117,128	73,593,993	72,298,907	75,467,615	65,148,200
TOTAL	649,713,256	634,190,156	695,895,472	691,063,682	757,332,778	921,737,729

*Includes sales to Turlock Irrigation District

TABLE 8
BUREAU OF LIGHT, HEAT & POWER

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES AND RECEIPTS
(INCLUDING ENCUMBRANCES)
FISCAL YEAR 1959-60

O.E.	Description	Budget	Actual	-Under Over
	EXPENDITURES			
110	Permanent Salaries	$ 81,600	$ 77,982	$ -3,618
111	Allowance for Overtime	729	447	-282
200	Contractual Services	2,655	1,997	-658
214	Alteration & Repair of Street Lighting Structures (Jointly-owned)	2,650	522	-2,128
214.1	Maintenance & Repair of Street Lighting Installations (City-owned)	72,000	78,649	6,649
216	Maint. & Repair of Auto Equip.	700	233	-467
231.1	Public Building Lighting	75,660	80,129	4,469
231.2	Lighting of Public Sts. (Pacific Gas & Elect. Co.)	450,456	457,455	6,999
231.3	Lighting of Public Streets (Hetch Hetchy)	451,843	468,236	16,393
231-XXX	Elect. & Gas-Interdepart.	2,933,968	3,055,507	121,539
300	Materials and Supplies	1,125	1,162	37
400	Equipment	900	713	-187
801	Accident Compensation	60	70	10
813	Auto Insurance	250	259	9
815	Miscellaneous Insurance	311	-0-	-311
860	Retirement Allowance	10,205	9,147	-1,058
865	Health Service System	458	425	-33
	TOTAL	$4,085,570	4,232,933	147,363
	RECEIPTS			
	Interfund Receipts*	$2,959,968	3,055,507	95,539
	Ad Valorem Taxes	1,125,602	1,177,426	51,824
		$4,085,570	4,232,933	147,363

*Transfers from other departments.

TABLE 9
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR ELECTRICITY FOR MUNICIPAL PURPOSES
FISCAL YEAR 1959-60

DEPARTMENT	NO. OF ACCTS.	CONSUMPTION KILOWATT-HOURS	EXPENDITURE
Art Museum	-	460,748	$ 6,582
Child Care Centers	8	57,526	1,618
City Planning	1	85,960	1,838
Commission on Equal Employment	1	977	26
DeYoung Museum	2	337,280	5,759
Disaster Corps.	2	2,967	121
Electricity	6	256,060	5,461
Employees Retirement	1	80,184	1,741
Farmers Market	1	7,066	200
Fire	64	1,339,743	32,921
Hassler Health Home	1	576,840	7,423
Health	21	4,574,799	52,754
Hetch Hetchy	9	9,382	403
International Airport (Incl. resale)	8	53,657,411	477,962
Legion of Honor	5	220,702	4,686
Library	28	1,526,748	27,945
Log Cabin Ranch	8	182,418	5,229
Municipal Railway	39	66,657,391	714,346
Parking Authority	1	1,983	53
Police	19	607,594	13,921
Public Buildings	11	4,209,682	49,687
Public Welfare	2	280,360	4,445
Public Works	42	18,052,776	238,850
Purchasing	10	202,896	3,645
Real Estate - Auditorium	3	1,080,496	16,724
Recreation and Park	173	6,666,730	118,772
Registrar of Voters	3	3,645	114
S. F. Unified School District	253	14,943,256	278,906
Sheriff	2	813,920	9,314
Street Lighting Operations	-	35,659,092	468,236
War Memorial - General	2	818,052	12,167
Water	104	37,501,724	320,137
Youth Guidance	1	970,320	11,480
TOTAL BY MUNICIPAL DEPARTMENTS	831	251,846,728	$2,893,466
Academy of Sciences	6	738,020	12,304
State of Calif.: Street Lighting)	3	(a)	11,378
Traffic Devices)		(b)	5,637
GRAND TOTAL	840	252,584,748	$2,922,785

(a) Included under Street Lighting Operations
(b) Included under Public Works

TABLE 10
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR GAS AND STEAM FOR MUNICIPAL PURPOSES
FISCAL YEAR 1959-60

NATURAL GAS

DEPARTMENT	NO. OF ACCOUNTS	CONSUMPTION IN HUNDRED CU. FT.	EXPENDITURE
Child Care Centers	8	21,351	$ 1,400
City Planning	1	4,026	258
Commission on Equal Employment	1	125	8
DeYoung Museum	2	49,110	2,753
Disaster Corps	1	300	29
Electricity	3	9,480	613
Farmers Market	1	530	43
Fire	91	478,686	29,599
Hassler Health Home	2	286,902	18,267
Health	19	3,723,038	173,017
Hetch Hetchy	6	1,718	158
International Airport	15	640,585	32,921
Library	26	70,782	4,619
Municipal Railway	12	198,798	12,520
Off Street Parking Bond Fund	1	50	4
Parking Authority	1	253	17
Police	12	64,187	4,683
Public Buildings	2	587,608	29,780
Public Works	11	488,395	31,643
Purchasing	5	40,392	2,376
Real Estate - Auditorium	2	1,978	143
Recreation & Park	98	928,828	57,730
Registrar of Voters	3	21,843	1,349
San Francisco Unified School Dist.	196	3,223,304	193,290
Sheriff	4	420,765	21,150
Single Men's Rehabilitation Center	1	42,298	2,737
War Memorial-General	3	184,024	11,148
Water	21	59,335	4,031
Youth Guidance	2	407,417	20,755
TOTAL BY MUNICIPAL DEPARTMENTS		11,956,108	$657,041
Academy of Sciences	1	138,822	8,395
GRAND TOTAL	551	12,094,930	$665,436

STEAM

(Does not include steam generated by City)

DEPARTMENT	NO. OF ACCOUNTS	CONSUMPTION IN POUNDS	EXPENDITURE
Public Welfare	1	1,556,000	$ 2,960

TABLE 11
BUREAU OF LIGHT, HEAT AND POWER

STREET LIGHTS IN SERVICE
JUNE 30, 1960

	COMPANY-OWNED	JOINTLY-OWNED	CITY-OWNED	TOTAL
UNDERGROUND CONNECTED				
High voltage series circuit:				
1,000 Lumen incandescent	--	31	--	31
2,500 " "	326	308	464	1,098
4,000 " "	2,546	548	2,735	5,829
6,000 " "	792	651	4,704	6,147
10,000 " "	989	45	520	1,554
20,000 " Fluorescent	5	--	25	30
20,000 " Mercury vapor	--	--	32	32
Low voltage multiple circuit:				
1,000 Lumen incandescent	--	--	171	171
2,500 " "	8	--	17	25
4,000 " "	173	1	22	196
6,000 " "	168	9	--	177
10,000 " "	--	--	8	8
20,000 " Fluorescent	36	--	71	107
20,000 " Mercury Vapor	1	--	30	31
OVERHEAD CONNECTED				
High voltage series circuit:				
2,500 Lumen incandescent	308	--	--	308
4,000 " "	12,632	--	31	12,663
6,000 " "	223	--	--	223
Low voltage multiple circuit:				
2,500 Lumen incandescent	6	--	--	6
4,000 " "	82	--	--	82
6,000 " "	112	--	--	112
TOTAL	18,407	1,593	8,830	28,830
	63.9%	5.5%	30.6%	100%

GRAND TOTAL:		
	June 30, 1960	28,830
	June 30, 1959	28,592
	Increase during the year	238

TABLE 12
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURES FOR OPERATION AND MAINTENANCE OF STREET LIGHTING
FISCAL YEAR 1959-60

CONTRACTUAL SERVICE (P. G. & E. COMPANY)			
Company-owned facilities (a)	$695,839		
Jointly-owned facilities (a)	67,445		
City-owned facilities (b)	167,759		
Emergency service to City-owned facilities	1,775	$932,818	
Less deduction for energy		479,615	$453,203
CONTRACTUAL SERVICE (R. FLATLAND COMPANY)			
Maintenance of City-owned facilities:			
Group replacement of lamps	38,240		
Replacement of lamp outages	5,122		
Glassware, painting, and miscellaneous	3,547	46,909	
Repair of City-owned facilities:			
Failure of equipment	11,618		
Damages by vehicles (c)	18,347	29,965	76,874
WORK BY MUNICIPAL RAILWAY			
Extensions to trolley poles to accommodate street lights			222
ELECTRIC ENERGY (HETCH HETCHY)			
35,659,092 Kilowatt-hours @ $0.01345			479,615
TOTAL EXPENDITURE			$1,009,914
LESS: Amount paid to Hetch Hetchy from Gas Tax for State Highway routes			11,378
TOTAL NET EXPENDITURE			$998,536

(a) Includes maintenance, repair, and fixed charges of Company-owned facilities, and electric energy.

(b) Includes service and switching charge, and electric energy.

(c) Where responsible party is known, claim is filed for reimbursement.

TABLE 13
BUREAU OF LIGHT, HEAT AND POWER

NEW CITY-OWNED STREET LIGHTING INSTALLATIONS
COMPLETED DURING FISCAL YEAR 1959-60

Location	No. of Lights	Type of Light*	Source of Funds**	Value
Ahern Way - Sixth to Harriet	2	Inc.	DPW	$ 1,369
Bacon Undercrossing (conduit, cable & transformer)	-	-	DPW	324
Battery, Bush & Sansome Streets (adjacent to Crown-Zellerbach Bldg.)	14	M.V.	P O	12,990
Cabrillo St.-La Playa to Great Hwy.	7	Fluor.	DPW	12,440
Central Freeway	10	Inc.	State	3,331
Christopher Dr. & Crestmont Dr.	13	Inc.	DPW	5,859
Clarendon Ave.-Stanyan to Laguna Honda	58	Inc.	DPW	32,290
Cortland Ave, Undercrossing (conduit, wire & controls)	-	-	DPW	429
Forest Knolls Tract #2	26	Inc.	P O	21,699
Harney Way at James Lick Freeway	7	M.V.	DPW	13,513
Hunters Point Road & Jamestown	21	Inc.	DPW	11,695
Lick Freeway - Salinas to Silver	22	Inc.	State	6,911
McKinley Avenue extension	10	Inc.	DPW	6,994
Lincoln Way at 3rd Avenue	3	Inc.	DPW	4,898
Point Lobos Avenue at 48th Avenue	1	Inc.	P O	1,185
Stanyan St. at Main Drive (Relocation of existing service)	-	-	DPW	324
Sunnydale Avenue at McLaren School	4	Inc.	DPW	3,337
Twin Peaks Blvd. (Relocation of existing system)	-	-	DPW	6,654
Yacht Harbor Extension	3	Inc.	Rec.& Park	3,861
Extensions to Municipal Railway Trolley Poles to accommodate pendant type street lights	-	-	BLHP	222
TOTAL	201			$150,325

*INC - Incandescent lamp
M.V.- Mercury Vapor lamp
Fluor - Fluorescent lamp

** BLHP - Bureau of Light, Heat and Power
DPW - Department of Public Works
Rec.& Park - Recreation and Park Dept.
P.O. - Property Owner

TABLE 14

BUREAU OF LIGHT, HEAT AND POWER

HISTORICAL COST OF CITY-OWNED STREET LIGHTING FACILITIES

		City Funds				Housing	Federal	State	Property	
		P. U. C.	D. P. W.	Park	Muny.Ry.	Auth.	Funds	Funds	Owners	Total
Prior to July 1,	1940	$ 366,959	$ 418,361	$ -	$ -	$ -	$336,070	$ -	$123,856	$1,245,246
Fiscal Year	1940-41	5,380	10,910	-	-	-	45,376	-	40,827	102,493
	1941-42	1,980	2,445	-	-	-	13,720	-	32,800	50,945
	1942-43	3,969	8,345	-	-	-	-	-	3,718	16,032
	1943-44	470	4,902	-	-	-	-	-	371	5,743
	1944-45	450	-	-	-	-	-	-	5,738	6,188
	1945-46	298	-	1,166	-	-	-	-	350	1,814
	1946-47	4,357	-	-	-	-	-	-	-	4,357
	1947-48	112,615	76,768	14,295	1,110	-	-	-	112,847	317,635
	1948-49	257,652	9,043	-	-	-	-	-	22,987	289,682
	1949-50	303,629	27,194	6,350	-	-	-	-	12,394	349,567
	1950-51	155,842	101,576	-	-	-	-	-	165,043	422,461
	1951-52	27,154	47,698	-	5,806	-	-	22,650	23,695	127,003
	1952-53	251,090	219,956	-	505	-	-	-	31,773	503,329
	1953-54	142,151	22,181	-	-	1,239	-	2,274	23,495	191,340
	1954-55	115,727	30,817	-	-	543	-	16,578	748	164,413
	1955-56	15,704	48,620	-	-	1,360	-	19,181	2,484	87,349
	1956-57	114,168	26,641	-	-	3,003	-	-	7,256	151,068
	1957-58	2,501	64,942	-	-	-	-	4,142	18,199	89,784
	1958-59	-	171,367	-	538	-	-	626	10,231	182,762
	1959-60	-	100,126	3,861	222	-	-	10,242	35,874	150,325
Total: June 30,	1960	$1,882,096	$1,391,892	$25,672	$8,181	$6,145	$395,166	$75,693	$674,691	$4,459,536
Less: Cost of portions removed										132,119
Original cost of facilities in service: June 30, 1960										$4,327,417

TABLE 15
HETCH HETCHY WATER SUPPLY & POWER SYSTEM

CONSTRUCTION CONTRACTS
FISCAL YEAR 1959-60

Contract No.	Description	Contractor	Contract Time Started	Contract Time Completed	Original Contract Price	Value of Work Done During Fiscal Year
HH-289	Furnish and Install Generators, Cherry Powerhouse	Allis-Chalmers Mfg. Co.	7-15-57	--	$3,169,520(a)	$266,722
HH-300A	Cherry Power Tunnel and Eleanor Diversion Tunnel	Guy F. Atkinson Co. The Arundel Corp. L. E. Dixon Co.	12-2-57	6-17-60	8,136,420	1,474,437
HH-316	Construct Cherry Powerhouse (Includes Install Items 1, 2, 4, and part of 6, below)	Gunther & Shirley E. V. Lane Co. Harms & Thomas	10-13-58	--	5,230,175	3,264,374
HH-317	Furnish and Install Crane-Cherry Powerhouse	Moffett Engr. Co.	10-6-58	12-5-59	95,736	63,819
HH-325	Construct Transmission Line - Moccasin to Station J (Includes Install Item 3 below)	John M. King Company	4-6-59	4-13-60	1,552,194	1,458,272
HH-326	Remove 22 KV transmission Line Priest to Early Intake	Mahoney Electric Co.	5-25-59	9-3-59	8,653	8,653
HH-328	Replace 4-Inch Pipe Moccasin Water System	Hetch Hetchy Bureau	6-1-59	7-28-59	2,233	2,233
HH-329	Construct Warnerville Sub-station (Includes Install Item 5 and part of Item 6 below)	Stolte, Inc.	6-29-59	--	887,916	855,958
HH-333	Reconstruct & Surface Road Jones Point to Mather	P. E. Woof	5-16-60	--	86,535	74,224
HH-334	Alterations to Moccasin Sewer System	Roy Madsen Const. Co.	6-20-60	--	27,794	8,585

(Cont'd)

TABLE 15 - (Cont'd)
HETCH HETCHY WATER SUPPLY & POWER SYSTEM

CONSTRUCTION CONTRACTS
FISCAL YEAR 1959-60

Item No.	Purchase Order No.	Description	Contractor	Contract Time Started	Contract Time Completed	Original Contract Price	Value of Work Done During Fiscal Year
(1)	61996	Furnish & Deliver Hydraulic Turbines, Governors, Valves, etc., Cherry Powerhouse	Pelton Division Baldwin-Lima-Hamilton	10-15-57	--	$2,429,418(b)	$383,275
(2)	85399	Steel Penstock Sections for Cherry Powerhouse	Southwest Welding & Mfg. Co.	6-26-58	1-19-60	1,694,900	724,467
(3)	93533	Transmission Tower Steel Moccasin to Station "J"	Bethlehem Pac. Coast Steel Company	9-19-58	8-31-59	436,414	407,364
(4)	3084	Power Transformers for Cherry Powerhouse	Allis Chalmers Mfg. Co.	1-14-59	--	930,208(c)	764,523
(5)	3085	Power Transformers for Warnerville Substation	Allis Chalmers Mfg. Co.	1-14-59	--	762,439(c)	557,693
(6)	13494	Oil Cir.Breakers for Warnerville Sub.& Cherry Pwhouse	Federal-Pacific Electric Company	5-1-59	--	1,118,731	515,945
		Total Amount of Hetch Hetchy Contract Construction Work Performed During Fiscal Year					$10,830,544

(a) Includes 25% Reserve for Escalation
(b) Includes 20% Reserve for Escalation
(c) Includes 10% Reserve for Escalation

TABLE 16
SAN FRANCISCO INTERNATIONAL AIRPORT

CONSTRUCTION CONTRACTS
FISCAL YEAR 1959-60

Contract No.	Description	Contractor	Contract Time Started	Contract Time Completed	Original Contract Price	Value of Work Done During Fiscal Year
A-217	Extension to Pier B	Harrod & Williams	3-9-59	11-6-59	$509,736	$331,931
A-224	Alterations to Commun. Rm. Terminal Building	Wilco Constr. Co.	4-6-59	9-25-59	14,793	13,134
A-226	Construct Taxiway Shoulders	O. C. Jones & Son	12-1-58	7-9-59	167,750	7,603
A-228	Escalators-Terminal Building	Arntz Contracting Co.	1-5-59	7-15-59	157,766	8,844
A-235	Apron Extension Paving and Utilities	Chas. L. Harney, Inc.	10-5-59	--	194,420	163,354
A-238	Automatic Door Operators Terminal Building	H. J. Drotleff & Son	1-5-59	7-15-60	58,648	5,722
A-239	Pavement for Runway Ext.	Fredrickson & Watson Co.	7-6-59	12-10-59	1,321,222	1,246,891
A-241	Extension of Timber Trestle	B. C. Gerwick	8-31-59	1-7-60	51,189	49,084
A-242	Runway & Taxiway Painting	The Empire Company	12-14-59	2-24-60	20,400	19,616
A-244	Air Cargo Bldgs. #2 & #3	Harrod & Williams	9-14-59	4-26-60	349,933	347,165
A-248	Paving, Utilities & Landscaping Main Entrance Road Area	Lowrie Paving Co.	4-11-60	--	102,564	80,150

(Cont'd)

TABLE 16 - (Cont'd)
SAN FRANCISCO INTERNATIONAL AIRPORT

CONSTRUCTION CONTRACTS
FISCAL YEAR 1959-60

Contract No.	Description	Contractor	Contract Time Started	Contract Time Completed	Original Contract Price	Value of Work Done During Fiscal Year
A-249	Remodel 4th Flr.-Term'l Bldg.	McBroom & Cecchini	6-11-60	--	$59,300	--
A-250	Utilities Extension Roads R-3 and R-6	McGuire & Hester	6-27-60	--	220,780	--
A-255	Additions to Toilets & Waiting Rooms - Term'l Bldg.	Martinelli Const. Co.	2-29-60	--	211,880	65,762
A-257	South Baggage Conveyor	Standard Conveyor Co.	5-16-60	--	38,573	--
A-258	Util. Exten. for Pier "B"	Associated Pipeline	7-20-59	10-18-59	18,360	16,887
A-264	Pavement & Utilities Cargo Apron Area	Chas. L. Harney, Inc.	10-19-59	4-21-60	243,483	210,600
A-267	Silt Removal	Berger Coastwise Const.Co.	6-22-59	7-27-59	2,825	2,959
A-268	Supplementary Feedwater Tank	Western Plumb.& Heat.Co.	7-27-59	8-15-59	1,137	1,137
A-269	Epoxy Resin - Asphalt Surfacing	Chas. L. Harney, Inc.	3-7-60	4-21-60	46,990	42,499
A-271	Pavement for Roads R-3, R-18	L. C. Smith Co.	9-28-59	--	73,054	69,505
A-272	Silt Removal	Jacobs Bros.	9-7-59	10-13-59	1,562	1,630

(Cont'd)

TABLE 16 - (Cont'd)
SAN FRANCISCO INTERNATIONAL AIRPORT

CONSTRUCTION CONTRACTS
FISCAL YEAR 1959-60

Contract No.	Description	Contractor	Contract Time Started	Contract Time Completed	Original Contract Price	Value of Work Done During Fiscal Year
A-273	Dredge Outfall Channel	Associated Dredging Co.	3-7-60	3-11-60	$11,000	$10,750
A-274	Lighting Runway 1-R Ext.	Dahl-Beck Electric Co.	4-18-60	--	67,353	68,325
A-276	Additional Transformer Bank - Substation I	Dahl-Beck Electric Co.	2-1-60	3-25-60	3,874	3,874
A-279	Ticket Counters, Office & Baggage Area - Term'l Bldg.	McBroom & Cecchini	4-11-60	--	74,308	34,768
	Total Amount of Airport Contract Construction Work Performed During Fiscal Year					$ 2,802,190

TABLE 17
MUNICIPAL RAILWAY

CONSTRUCTION CONTRACTS
FISCAL YEAR 1959-1960

Contract No.	Description	Contractor	Contract Time Started	Contract Time Completed	Original Contract Price	Value of Work Done During Fiscal Year
MR-460	Rearrange Overhead Lines, for Central Freeway	Abbett Elect. Co.	10-19-59	11-30-59	$10,875 *	$10,817 *
MR-462	Station and Repairs, East Portal, Twin Peaks Tunnel	Stenmark Const. Co.	9-11-59	12-3-59	5,854	5,854
MR-463	Remove Block Paving & Repave, California Street, Van Ness Ave., to Mason St.	Lowrie Paving Co.	7-13-59	8-12-59	13,425	13,027
MR-467	Repairs & Painting, East Portal, Twin Peaks Tunnel	Phoenix Painting Co.	6-6-60	- - -	6,740	3,315
Total Amount of Municipal Railway Contract Construction Work Performed During Fiscal Year						$33,013

*Includes City-furnished materials

CITY AND COUNTY OF SAN FRANCISCO

PUBLIC UTILITIES COMMISSION

ANNUAL REPORT

HETCH HETCHY WATER SUPPLY, POWER AND UTILITIES ENGINEERING BUREAU

AND

BUREAU OF LIGHT, HEAT AND POWER

FISCAL YEAR 1960-61

O. L. MOORE
General Manager

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AND
BUREAU OF LIGHT, HEAT AND POWER

ANNUAL REPORT

FISCAL YEAR 1960-61

I. INTRODUCTION

The Hetch Hetchy Water Supply, Power and Utilities Engineering Bureau and the Bureau of Light, Heat and Power are bureaus of the Public Utilities Commission of the City and County of San Francisco. The functions of these two bureaus are administered under one General Manager. Accordingly, this report covers the activities of both bureaus for the fiscal year 1960-61.

The Hetch Hetchy Water Supply, Power and Utilities Engineering Bureau combines the functions of an operating department with those of an engineering bureau serving other operating departments of the Public Utilities Commission. In the first capacity it has full charge of the Hetch Hetchy water supply and electric power system, with responsibility for its administration, planning, engineering, construction, operation, and maintenance. In the second capacity it performs engineering work for the Airport Department and for the Municipal Railway, including planning and supervising all new construction for those utilities and providing engineering service in connection with maintenance and reconstruction of the existing facilities.

The Bureau of Light, Heat and Power combines the functions of a service bureau to provide for furnishing utility services for municipal purposes with those of an operating bureau to provide for the lighting of public streets. In the first capacity it is responsible for arranging, under contracts, for the furnishing of electric, gas and steam services to municipal departments and for supervising the performance and checking of monthly billing under such contracts. In the second capacity the Bureau has jurisdiction over general planning and improvements of street lighting and supervises street lighting operation and maintenance under contractual arrangements. By agreement with the Department of Public Works, the functions of all financing, design and construction of City-owned street lighting improvements are performed by that department subject to review and approval by the Public Utilities Commission through the Bureau of Light, Heat and Power.

The activities of the two bureaus during the fiscal year were financed and conducted under the following five budgets:

Budget	No. of Positions	Total Amount Appropriated
Hetch Hetchy Project	119	$ 10,375,800
Utilities Engineering Bureau	156	1,433,200
Bureau of Light, Heat and Power	12	4,389,800
1955 Hetch Hetchy Power Bond Fund	---	1,785,000 (a)
1956 Airport Bond Fund	---	1,557,000 (a)
		$ 18,227,100 (b)

(a) Does not include funds previously appropriated for construction under way or completed during the fiscal year 1960-61.

(b) Excludes duplications due to budget transfers.

The total value of construction work performed under the direction of the Hetch Hetchy Water Supply, Power and Utilities Engineering Bureau during the fiscal year on the Hetch Hetchy Project, the San Francisco International Airport, and the Municipal Railway was approximately $5,900,000. At the close of the year an additional $2,600,000 of work was under construction.

On March 1, 1961, Harry E. Lloyd, General Manager and Chief Engineer of the two bureaus, retired after thirty-three years of devoted service to the City and County of San Francisco. As his successor, Oral L. Moore was appointed General Manager by the Public Utilities Commission.

II. HETCH HETCHY WATER SUPPLY AND POWER SYSTEM

Description

The Hetch Hetchy development is primarily a water supply project utilizing the precipitation and runoff of the upper Tuolumne River watershed, on the westerly slope of the Sierra Nevada Mountains, some 150 miles east of San Francisco Bay. This supply supplements local sources in San Mateo and southern Alameda counties for domestic water used by the City and County of San Francisco and its suburban customers.

Electric energy generated from the falling water is conveyed to San Francisco over transmission lines of the City and of the Pacific Gas and Electric Company under a wheeling agreement. This source supplies municipal needs including water supply pumping stations, municipal airport, street transit system, street lighting, public building lighting, and miscellaneous other loads. Electric energy is also supplied to two irrigation districts in the San Joaquin Valley to supplement their own generating facilities and to three industrial customers, two located in Santa Clara County, and one in Contra Costa County. Load requirements in excess of the City's Hetch Hetchy generation are supplied by supplemental power and energy purchased from the Pacific Gas and Electric Company.

Revenue received from electric power sales and from the wholesale delivery of water to the San Francisco Water Department for further transmission and ultimate distribution and sale to consumers makes the Hetch Hetchy Project self-supporting.

The operating properties of the Hetch Hetchy water supply and power system are located in Tuolumne, Stanislaus, San Joaquin, and Alameda Counties and include: Eight dams with appurtenant impounding and regulating reservoirs and diversion works; sixty miles of tunnels; ninety-five miles of aqueduct pipe lines; electric distribution, telephone and radio communication systems for project use; and appurtenant structures, maintenance and repair shops, and access roads.

In addition to the foregoing, electric generation and transmission facilities in operation at the start of the fiscal year included: Moccasin Powerhouse, 80,000 KVA; Early Intake Powerhouse, 3,800 KVA; ninety-nine miles of 115,000-volt and forty miles of 22,000-volt transmission lines. On August 1, 1960, Cherry Powerhouse, 150,000 KVA, was placed in service, together with the new 230,000-volt Intake Switchyard; fifty miles of 230,000-volt transmission line extending from Cherry Powerhouse and Intake Switchyard to the new switching and step-down transmission station, Warnerville Substation, near Oakdale; and twelve miles of 115,000-volt transmission line extending westward from Warnerville Substation to serve two irrigation districts.

These additional generating and transmission facilities represent the first stage of the Canyon-Cherry Power Development, financed from the 1955 Hetch Hetchy Power Bonds. The Canyon project, scheduled for completion in 1964, will provide an additional 75,000 KVA of generation capacity, and will complete the power system expansion program authorized under the 1955 bond issue.

Included in the Appendix is a map showing the San Francisco water and power systems.

Revenue and Expenditures

Revenue received from the operation of the Hetch Hetchy Project is derived principally from two sources:

1. Wholesale delivery of water to the San Francisco Water Department;

2. Sales of electric power and energy to San Francisco municipal departments, the Modesto and Turlock Irrigation Districts in the San Joaquin Valley, and three industrial customers -- Permanente Cement Company, and the Kaiser Aluminum and Chemical Corporation's aluminum foil plant, both located in Santa Clara County, and the Dow Chemical Company, located at Pittsburg in Contra Costa County.

Revenue received from the sale of water and for standby service to the San Francisco Water Department for the fiscal year 1960-61 was $4,500,000, the same amount as for the previous year.

Gross sales of electric energy during the year amounted to $6,948,453, compared to $6,593,187 during the previous year, an increase of 5.4 percent. There was an over-all increase in gross revenue from sales to the City's municipal departments of 2.2 percent. Energy requirements for street lighting, public works, and the municipal transit system showed little change from the previous year. There was a decrease of 8.7 percent in gross revenue from sale of electric energy to the Water Department, which was offset by increases in sales of 8.6 percent to the San Francisco International Airport; 8.2 percent to the San Francisco Unified School District; and 6.8 percent to the combined other City departments. Gross revenue from sales to the Modesto and Turlock Irrigation Districts increased 5.4 percent. There was a decrease of 6.5 percent in sales to the two Permanente industrial customers, which was offset by gross revenue amounting to $307,560 from a new customer, the Dow Chemical Company, during the months of May and June, 1961.

Revenue from other sources amounted to $65,642, made up of service orders, rentals, meals, sale of surplus property, and other miscellaneous items.

Expenditures for purchased power amounted to $1,026,815, compared to $2,551,163 last year. This reflected increased project generation resulting from operation of Cherry Powerhouse beginning August 1, 1960. However, the expenditure for purchased power required a supplemental appropriation, since it was $330,915 over the original budget estimate of $695,900, which was based on anticipation of normal water conditions. These did not materialize, and the continuing shortage of water forced considerable curtailment of generation, particularly during the month of March, 1961. Normal generation was resumed during the spring runoff beginning in April, 1961, which permitted increasing the system load by the addition of the Dow Chemical Company.

There was some increase in service charges for transmission and distribution of Hetch Hetchy power over the system of the Pacific Gas and Electric Company, including a transportation charge of $44,000 for energy delivered over the Company's transmission facilities to the Dow Chemical plant. Total charges amounted to $1,466,090, compared to $1,359,272 last year.

Bond interest and redemption costs on outstanding Hetch Hetchy bonds amounted to $6,131,088 for the fiscal year 1960-61.

Tables 1, 2 and 6 show comparative data on receipts, expenditures, and sales of water and power in the operation of the Hetch Hetchy water supply and power system.

Taxes

Taxes for the 1960-61 fiscal year on properties under the jurisdiction of the Hetch Hetchy Project, all located outside the City and County of San Francisco, were paid in the following amounts:

Tax-Levying Body	Assessed Value	Taxes Paid
Alameda County	$ 2,200	$ 174.13
Mariposa County	70	3.24
San Joaquin County	4,950	300.86
San Mateo County	1,715	125.05
Stanislaus County	51,820	3,536.20
Tuolumne County	6,299,550 (a)	344,115.85 (b)
Banta-Carbona Irrigation District	(d)	127.68
Modesto Irrigation District	(d)	-0- (c)
Oakdale Irrigation District	(d)	862.40
West Stanislaus Irrigation District	(d)	99.00
City of Redwood City	(d)	36.12
	Total	$ 349,380.53

(a) Includes $6,062,100 assessment for water rights.
(b) Includes taxes on unsecured property.
(c) Tax rate for fiscal year 1960-61 set at $0.00.
(d) All of the City's properties within the Modesto Irrigation District, Oakdale Irrigation District, and West Stanislaus District are included in the assessed valuation of Stanislaus County; those within the Banta-Carbona Irrigation District are assessed separately but are included in the assessed value of San Joaquin County; and those within the City of Redwood City are included in the assessed valuation of San Mateo County.

For the fiscal year of 1960-61, the Tuolumne County Assessor placed an assessed valuation of $6,062,100 on the City's water rights in the county based on five points of diversion. On August 16-18, 1960, a hearing was held before the State Board of Equalization in Sacramento relative to the assessment of the City's water rights in Tuolumne County. On September 2, 1960, the State Board of Equalization issued a decision reducing the assessed valuation on the City's water rights to $1,214,000, assessing only those water rights at Lake Lloyd which the City acquired from private

owners. Subsequently, Tuolumne County filed an action for a review of the Board's decision in the Tuolumne County Superior Court. Trial was held on January 19, 1961, before Judge Warren Steel of Marysville, a visiting judge, who rendered an opinion upholding the decision of the State Board of Equalization. An appeal to the State Supreme Court by Tuolumne County is now pending. The Assessor of Tuolumne County submitted tax bills for the fiscal year 1960-61 for the full amount of his assessment and the City paid these taxes under protest.

Water Production and Transmission

Precipitation on the Tuolumne River watershed for the fiscal year 1960-61 was subnormal for the third consecutive year. The seasonal total precipitation at O'Shaughnessy Dam was 23.38 inches compared to an average seasonal total of 33.77 inches for the past forty-three year period. Consequently, the total runoff was approximately fifty percent of normal, and Hetch Hetchy Reservoir, which has a capacity of 360,360 acre-feet, reached a storage peak of only 208,000 acre-feet.

Due to the low runoff on the Tuolumne River watershed it was not necessary at any time during the year to release water from any of the reservoirs on the Tuolumne River for flood control, as provided under agreement with Corps of Engineers, U. S. Army.

During the year, 52,972,190,000 gallons of water were delivered by the City from the Tuolumne River watershed through the Hetch Hetchy Aqueduct to the San Francisco Bay Area. This included 44,890,000 gallons delivered to the United States Atomic Energy Commission at Mocho Shaft for use at the Lawrence Radiation Laboratory at Livermore.

Table 3 shows comparative data on precipitation, runoff, storage, and delivery of the Hetch Hetchy water supply system.

Despite the relatively dry year, nearly normal power production was maintained through effective planning and coordination with the Modesto and Turlock Irrigation Districts for maximum utilization of available water. However, it was evident at the end of the fiscal year that to assure the City's domestic water supply, drastic curtailment in power generation during the fall of 1961 would be necessary to conserve storage until the next runoff period.

An agreement was entered into between the United States Atomic Energy Commission and the City and County of San Francisco under which the City will supply water at Mocho Shaft of the Hetch Hetchy Aqueduct for use at the Lawrence Radiation Laboratory at Livermore, California. The Atomic Energy Commission installed at its expense, pumps, ten miles of ten-inch pipe line, and all necessary facilities to transport water to the laboratory site, at a cost in excess of $400,000. Delivery of water commenced on February 24, 1961. It is estimated that the Atomic Energy Commission's requirements will increase from an initial amount of 350,000 gallons per day to 500,000 gallons per day by 1970. This service is paid for at the established rates of the San Francisco Public Utilities Commission.

Power System Operation

The newly constructed Cherry Powerhouse began operation on August 1, 1960. The Cherry generation schedule, combined with the schedule at Moccasin Powerhouse, was designed to meet the requirements of the City's existing customers, i. e., municipal departments, the irrigation districts, and the two industrial customers in Santa Clara County. Inasmuch as the plant would have to draw on storage in Lake Lloyd, which at the time was less than half full, it was planned to defer acquisition of new customers until the start of the runoff season in 1961. Cherry Powerhouse continued to operate until the end of February, 1961, at which time storage in Lake Lloyd was exhausted. The plant was shut down during the month of March, 1961, in order to build up storage and, in addition, to effect certain necessary repairs on the hydraulic equipment.

When generation was resumed on April 1, 1961, it became apparent that the seasonal runoff would approach a record low, with most of the water stored in City's reservoirs at the end of the runoff belonging to the Modesto and Turlock Irrigation Districts. Since the Districts would require release of their water for irrigation during the period April to August, inclusive, a plan of operation was set up to meet the needs of the Districts and, at the same time, to utilize as much water as possible for power generation. Accordingly, Moccasin Powerhouse was placed on its normal generation schedule, and Cherry Powerhouse generation was increased to a level calculated to draw down storage in Lake Lloyd by the end of August, 1961. In order to provide an outlet for the resultant increase in generation, assignment to the City of the electric service contract between the Pacific Gas and Electric Company and the Dow Chemical Company was made effective on May 1, 1961.

Generation at Moccasin Powerhouse was normal throughout the year except during the period November 1 to December 15, 1960, and again during the month of March, 1961, when generation was curtailed in order to conserve storage in Hetch Hetchy Reservoir.

The Early Intake Powerhouse, which has a capacity of 3,800 KVA, was first placed in operation in 1918 to provide power for construction of O'Shaughnessy Dam and the Mountain Tunnel to Moccasin. The water which would normally be used to operate this plant is now diverted through the new Cherry Powerhouse for more effective use. Consequently, on August 25, 1960, the Early Intake Powerhouse, which will eventually be abandoned, was shut down and placed in standby condition.

During the year the Hetch Hetchy system purchased approximately 116,200,000 kilowatthours of energy to supplement the generation of its own plants. The greater portion of this supplementary energy was purchased during the month of July, 1960, before Cherry Powerhouse began operation, and again in March, 1961, when Cherry Powerhouse was shut down and Moccasin generation curtailed, due to shortage of water. Purchases for these two months were 30 million and 51.6 million kilowatthours, respectively. There was also some increase in purchased energy in November and December, 1960, due to partial curtailment of generation during those months. Combined with the effect of adverse water conditions on purchased energy requirements was

the fact that energy deliveries to the Modesto and Turlock Irrigation Districts amounted to 513,800,000 kilowatthours, an increase of 19 percent over last year. This increase reflected continuing load growth in the Districts' service area, as well as the effect of reduced generation at the Districts' Don Pedro plant caused by the water shortage.

Tables 4 to 7, inclusive, show comparative operating statistics for the Hetch Hetchy power system.

Power Agreements

Agreements between the City and the Modesto Irrigation District and between the City and the Turlock Irrigation District for the sale and purchase of electric power were executed on December 20, 1960, and were made effective commencing January 1, 1961. The new agreements take the place of a single agreement between the City and the Districts, which was due to expire in 1962, and reflect an adjustment in rates and charges in line with present-day costs.

In August, 1960, three agreements, assigning to the City the electric service contracts between the Pacific Gas and Electric Company and Dow Chemical Company, Hercules Powder Company, and Shell Chemical Corporation, were executed by the City, the Pacific Gas and Electric Company, and their respective customers. Each assignment will be made effective at the option of the City whenever City's output of electric power and energy from its Hetch Hetchy generating plants exceeds the amount of electric power and energy required by the City for its own municipal purposes and for its customers. The assignments are being made as a temporary accommodation to assist the City to utilize fully the power and energy output from its Moccasin, Cherry, and future Canyon plants. They will continue in effect as long as required up to April 30, 1972.

In addition, an agreement was entered into between the City and the Pacific Gas and Electric Company providing for the following:

1. Supply of supplemental power and energy which City may require over and above the output of its plants to meet its obligations under the assigned contracts;

2. Delivery for the City by the Company of power and energy over its facilities to the three new industrial customers;

3. Extension of the 1945 group of contracts between the City and the Company until 1972. These include the so-called "Main Contract" and the assignment contracts with Permanente Cement Company and with Kaiser Aluminum and Chemical Corporation.

The agreement provides for payment by the City to the Company of one mill per kilowatthour for transporting Hetch Hetchy energy over the Company's facilities to the three new industrial customers.

The rates and charges for supplemental power and energy which the City purchases from the Company for delivery to the new industrial customers result in cost to the City which is equal to the revenue received by the City from the customers for such power and energy, after accounting for line losses, transportation charges, and customers' power factor discounts.

Agreement for Allocation of Water

Because of the continuing period of subnormal precipitation and runoff, the Public Utilities Commission, in May, 1960, approved the negotiation of an agreement with the Turlock and Modesto Irrigation Districts for the allocation of water during the 1960 calendar year to the various reservoirs on the Tuolumne River and the adjustment of power revenue resulting from such allocation. This negotiation resulted in an understanding between the City and the Districts whereby the Districts agreed to regulated release, through the Moccasin Powerhouse, of water to which they are entitled under the Raker Act, supplemented by sufficient additional releases from Lake Lloyd to meet their irrigation requirements, thus foregoing their right to their full Raker Act entitlement for storage in Don Pedro Reservoir during the sixty-day period April 15 - June 14, inclusive. As a result, storage in Lake Lloyd on August 1, 1960, when Cherry Powerhouse started operation, was 113,818 acre-feet, compared to a storage of 22,855 acre-feet which would have resulted if the Irrigation Districts had received their water at the rates and at the times specified in the Raker Act.

By holding back water belonging to the Districts, Cherry Powerhouse was able to generate an additional 186,321,410 kilowatthours, thereby increasing the City's revenue for power in the amount of $760,000. However, this retention in City's reservoirs of water due the Districts reduced the operating head on the Districts' Don Pedro Powerhouse, resulting in a loss of electric power generation. By reason of this loss of generation, Turlock Irrigation District and Modesto Irrigation District found it necessary to purchase supplemental power required for their distribution systems at a cost of $41,841.53 and $31,001.95, respectively. On June 26, 1961, the Board of Supervisors approved payment of the above amounts, a total of $72,843.48, to the respective Districts, as compensation for the loss of power generation.

Improvements to Operating Properties

Due to the sale of bonds during the past several years for the construction of the $54,000,000 Canyon-Cherry Power Development, total annual bond interest and redemption costs on outstanding Hetch Hetchy bonds have increased considerably. Consequently, major additions and replacements to the operating properties were deferred during the year until such time as the increase in power revenue from the operation of the new Cherry Powerhouse will provide sufficient funds.

During the fiscal year the following improvements to the operating properties of the Hetch Hetchy Project were completed:

Connection of the City's new 115,000-volt transmission lines between Warnerville Substation and Substation J of the Modesto Irrigation District necessitated a rearrangement of switching and bussing at that substation, which, in turn, required relocation of City's metering equipment. In addition, the station capacity was increased so that the capacity of the City's metering current transformers was no longer adequate. The relocation was accomplished by an exchange with the District of towers and appurtenant disconnect and by-pass switches. Metering current transformers of increased capacity were purchased and installed.

The Mather Road, from the top of Early Intake Hill to Mather, which was reconstructed last fiscal year, was given a seal coat to complete the project.

The Moccasin sewer system adjacent to the re-regulating reservoir was reconstructed in order to conform with the requirements of the State Department of Public Health.

New chlorination equipment was installed at Tesla Portal Chlorination Plant of the Hetch Hetchy Aqueduct. This equipment replaced the master chlorinator which had become inoperative and which was uneconomical to repair.

The roofs on six cottages at the Moccasin headquarters were replaced.

Alterations to Cottage No. 1 at O'Shaughnessy Dam were completed during the year. The work consisted of enlarging one bedroom, rearrangement of the interior of the westerly wing of the cottage, and constructing new natural stone steps.

Canyon-Cherry Power Development

The $54,000,000 Hetch Hetchy power bond issue approved by the electorate of San Francisco in November, 1955, authorized the construction of two hydroelectric power plants as additions to the Hetch Hetchy power system.

The first plant, Cherry Powerhouse, was completed during the year and placed in operation on August 1, 1960. This plant utilizes water stored in Lake Eleanor and behind the recently completed Cherry Valley Dam. The water is conveyed through a pressure tunnel six miles long to a point on the Cherry River near its confluence with the Tuolumne River. At this point the water drops approximately 2,400 feet to the powerhouse to supply two generators having a combined nameplate capacity of 135,000 kilowatts. Power from this plant is transmitted from the nearby Intake Switchyard over a 230,000-volt, double circuit transmission line to a new transmission substation (Warnerville) near Oakdale, approximately fifty miles westerly. This substation steps down the voltage from 230,000 volts to 115,000 volts for delivery of power over a double circuit transmission line extending another twelve miles to serve the Turlock and Modesto Irrigation Districts. The substation also provides a connection with the system of the Pacific Gas and Electric Company. The total cost of the first stage of the Canyon-Cherry Power Development, including engineering, was approximately $30,000,000.

The second plant, the Canyon Powerhouse, will develop the power drop between O'Shaughnessy Dam and Early Intake Diversion Dam. At present the water

released from O'Shaughnessy Dam flows down the natural stream bed of the Tuolumne River to Early Intake, where it is diverted through nineteen miles of tunnel to Moccasin Powerhouse. By the construction of eleven miles of a new pressure tunnel between O'Shaughnessy Dam and Early Intake, a power drop of approximately 1,370 feet can be realized. The combined nameplate capacity of the two generators in this powerhouse will be 67,500 kilowatts.

In February, 1958, an amended Raker Act application was filed at the Sacramento office of the Bureau of Land Management for the relocation of the Canyon Power Project from the south side of the Tuolumne River to the north side, which would reduce the cost of construction by an estimated $1,000,000. Due to the inability of Federal agencies and the City to agree on the amount of water to be released down the Tuolumne River below O'Shaughnessy Dam for preservation and enhancement of fish life and recreation, negotiations were delayed. Subsequently, a special hearing was held by the Department of Interior in San Francisco in September, 1960, to determine if the City had been diligent in its construction of the Hetch Hetchy Project. On May 1, 1961, notice was received from Secretary of the Interior, Stewart L. Udall, that he had approved the City's application contingent upon execution of certain stipulations by the City relative to the water release. These stipulations were executed and forwarded to Washington, D. C., and receipt was acknowledged on May 26, 1961, which became the effective date of approval of the application. This approval has permitted commencement of construction of the Canyon Power Project, which is scheduled to be completed in 1964.

Engineering work on the Canyon Power Project was continued during the year by both the Bureau's staff and that of Sverdrup and Parcel, Inc., who are furnishing engineering services under contract for the Canyon-Cherry Power Development.

New Don Pedro Dam

Under agreements for the development of the Tuolumne River watershed on a cooperative basis, studies are being continued by the City of San Francisco, Turlock and Modesto Irrigation Districts, and the Corps of Engineers, U. S. Army, for the development of additional storage capacity by the construction of a new dam on the Tuolumne River about a half mile downstream from the Districts' present Don Pedro Dam. This project, as proposed, will provide necessary additional storage space for the City in lieu of constructing more expensive storage facilities in the upper watershed, additional storage space and facilities for irrigation and power generation for the Irrigation Districts, and additional flood control space for the Corps of Engineers in its program for protection of the lower Tuolumne River from flood damage.

To accomplish these purposes, it is proposed to construct the new dam with a reservoir capacity of 2,030,000 acre-feet, seven times the present capacity. The two irrigation districts will furnish the damsite, which they now own, and the lands which will be covered by the new reservoir. The City of San Francisco will supply an estimated $42 million, and the Federal Government an estimated $3 million toward the cost of the dam.

The Federal portion may be adjusted upward following re-evaluation of flood control benefits. This upward adjustment would correspondingly reduce the City's portion. For these expenditures the City will acquire 570,000 acre-feet of storage space, and the Government will secure 340,000 acre-feet of flood control storage space. Such portion of the latter space which is not reserved for flood control at any time will be available for conservation storage, fifty percent each to the City and the Districts. This will result in maximum possible storage space of 740,000 acre-feet available to the City in the new reservoir, which will assure a dependable water supply for ultimate diversion of an estimated 400 million gallons daily to the Bay Area for domestic purposes and will safeguard the City's power revenues by assuring full capacity operation of its power plants.

Funds in the estimated amount of $45 million for the City's participation in this project are included in a new bond issue of $115 million for improvement of the City's water supply. This bond issue has been approved by the Mayor's Bond Screening Committee and the Board of Supervisors and will be submitted to the electorate in November, 1961.

San Joaquin Pipe Line No. 3

Water from the Hetch Hetchy Reservoir is now brought across the San Joaquin Valley in two pipe lines, each 47.5 miles in length, from Oakdale Portal in Stanislaus County to Tesla Portal in San Joaquin County. These two lines have been operating at full capacity of 160 million gallons per day for the past two years, and it is proposed to construct a third pipe line paralleling the existing lines to ensure an ample supply of water from Hetch Hetchy sources for the San Francisco Bay Area. The new pipe line, to be built in the existing right-of-way, will increase the capacity of the Hetch Hetchy aqueduct to about 295 million gallons per day. Funds in the amount of $22 million for construction of this third line are included in the proposed bond issue to be submitted to the electorate in November, 1961.

Springs and Wells Damage

In collaboration with the City Attorney's Office, the Bureau has been actively engaged in the settlement of claims for alleged damages to springs and wells on private properties due to the construction of the Foothill Tunnel by the City in the late 1920's. The following claims were settled during the year:

Claimant	Amount of Settlement	Date of Release
Clarence J. Rosasco (Including Fred Kassabaum's property acquired by Mr. Rosasco)	$ 1,750	July 28, 1960
Louis B. Price	$ 100	April 17, 1961

Surplus Property

Several parcels of surplus Hetch Hetchy property were sold by the City's Director of Property. These parcels, generally irregular in shape, were located in the cities of Oakdale, Fremont, and Redwood City, and were sold to the various highest bidders for a total sum of $6,800. The original total cost of these parcels was $1,595.

State Legislation

A complete record of all water legislation introduced in the State Legislature during the 1961 session was kept by this Bureau. Bills were analyzed for their effect on the City's utilities, and joint recommendations were made with the San Francisco Water Department to the Manager of Utilities for City action through the Mayor's Legislative Committee. During the 1961 session, sixty-four Senate bills and fifty-eight Assembly bills were studied, and as a result of the committee's recommendations, several bills which were adverse to the City's interest were amended, held in legislative committees, or referred to interim committees.

Status of Hetch Hetchy Construction Contracts

A summary of Hetch Hetchy construction contracts, including work on the Canyon-Cherry Power Development, in progress during the fiscal year 1960-61 is shown in Table 16.

III. AIRPORT ENGINEERING AND CONSTRUCTION

General

The program for improvements to San Francisco International Airport under the $25,000,000 airport bonds approved by the electorate in November, 1956, is well advanced in planning, design, and construction. Both in the terminal area and in the landing field areas, the effects of construction are noticeable as the Airport facilities were expanded during the fiscal year to meet the requirements of additional traffic of the jet age.

Included in the Appendix is a map showing the Master Plan for the San Francisco International Airport.

Construction Progress

An extensive project of runway and taxiway reconstruction was accomplished with minimum interference to aircraft operations. Runway 10L-28R was extended to 9,700 feet upon the completion of paving, drainage, and electrical work.

Fill for the extension of Runway 1R-19L and for an air navigation facility was completed. A contract for the construction of pavement for this extension was just under way at the close of the fiscal year. This construction, which will include an access taxiway, will extend Runway 1R-19L bayward 500 feet for a total length of 9,500 feet.

Fill for the easterly extension of Runway 28L, which will provide for increasing the length of this runway to 9,500 feet, was well under way with the working edge of fill extended about 600 feet.

The landing field lighting system was extended with the installation of runway, obstruction and taxiway lights for the Runway 1R extension area. The latter consisted of centerline button light units on Taxiway B, the first commercial installation of its kind in the United States. Comments from airline pilots indicate that these button lights, which project approximately one-half inch above the pavement surface, provide guidance superior to that of conventional side lights.

Under a separate contract, the reconstruction of the deteriorated and non-standard portions of the runway lighting system was nearing completion.

Fill for the maintenance base areas and for the commercial areas adjacent to the Airport main entrance road was virtually complete at the close of the fiscal year. Services for the maintenance base area were augmented with the extension of water, drainage, and sewer pipe lines and power and telephone ducts along Roads R-3 and R-6 and Taxiway R.

Plans and specifications were completed and the contract advertised for the paving of Road R-2 from Plot 3 to the intersection of former Bayshore Highway and Millbrae Avenue and for the construction of an extension of

the drainage system. The new road will provide permanent vehicular access to Plots 3, 3B and 3C.

A variety of improvements were made in the Terminal Building area. These included the enlargement of main floor restrooms; additional ticket counters and offices in the south portion of the main floor; a baggage conveyor and enclosure for the baggage handling area under the South Concourse; remodelling of the fourth floor; remodeling of the Pier D ground floor; and extensive improvements to the North Concourse and Pier B.

Work necessary to prepare the site for the new South Terminal Building was well under way. Existing utilities were permanently relocated, and steam and electric services were being temporarily relocated, without interrupting the continuity of these services. Demolition of the existing service building and pile driving for the South Terminal Building were just beginning at the close of the fiscal year.

A temporary parking lot just south of the main entrance road, with a capacity of 800 automobiles, was completed and placed in operation.

The Airport sewage treatment plant was enlarged with the construction and installation of additional facilities and the rebuilding of certain existing facilities.

Status of Airport Construction Contracts

A summary of the Airport construction contracts in progress during the fiscal year 1960-61 is shown in Table 17.

Planning for Future Development

Plans and specifications for the new South Terminal Buildings and Piers F and G were completed, and the contract was authorized for advertising. The Bureau, which has acted in a coordinating capacity for the consultant architects and engineers, checked all progress and final construction drawings and drafts of specifications. Additional studies and preliminary plans were proceeding for the aircraft apron, ground-level and elevated roads for the Terminal Area Complex, and for furniture and operating equipment for the South Terminal Building.

General studies were being conducted for a terminal area parking facility which will have an ultimate capacity of 8,000 automobiles. The construction of this facility is expected to be accomplished in stages, and detailed consideration was being given to the first stage. Planning for the overall development of the area adjacent to the Airport main entrance road was also undertaken.

Preliminary plans were under way for alterations and additions to Piers B and E, to provide additional offices and facilities for both present and new tenants. Improvements were also contemplated for ticket counters and the communications system in the Terminal Building and Pier B.

Plans and specifications were nearing completion for the construction of a 24-inch water main from the San Francisco Water Department supply line. The new main will create a service loop and will furnish an auxiliary source for fire protection and water supply. A supplemental connection for the existing supply line to the Water Department Sunset Supply line will also be constructed.

Preliminary studies were being made for the reconstruction of Runway 1R-19R and a portion of Runway 10L-28R; enlargement of the maintenance base area; and improvements to the drainage control system.

A study of the acoustical feasibility of a proposed sound barrier at the end of Runway 1R was conducted during the year. The study indicated that the barrier would effect a reduction of jet aircraft noise for communities adjacent to the end of the runway.

A preliminary investigation was made into the costs and problems attendant upon the development of Airport lands west of Bayshore Freeway for industrial use.

The discharge of Airport drainage waters into San Francisco Bay was investigated. After assessing data collected from tenants and reports of chemical analyses by independent laboratories and observing visual indications of active aquatic life, it was concluded that the present Airport effluent is neither causing a nuisance nor constituting pollution. The State Water Pollution Control Board has this matter under advisement.

Preliminary plans are being prepared for the City's portion of an Approach Landing System for Runway 19L. The Federal Aviation Agency and the airlines have requested such a facility.

The parking of aircraft fueling trucks on Airport aprons was studied and a recommendation made that an area adjacent to Plot 3 be specifically set aside for this function and a plan be developed accordingly.

The engineering work required for Federal Airport Aid Project No. 9-04-034-6118 was completed. This work required the preparation of plans and specifications and engineering report on the necessity for the extension of Runway 10R-28L.

Lease drawings and engineering studies were prepared for leases for Plots 1, 3B, 3C, 6 and 10.

Financing

Under the $25 million 1956 airport bond program a total of $9,958,000 in construction contracts has been spent to date. Also, funds from airport revenues were appropriated in the amount of $639,000 for runway reconstruction, $200,000 for an acoustical barrier for Runway 1R, and $1,000,000 for extension of Runway 28L.

During the year the Federal Government, through the Federal Aviation Agency, allocated to the City $1,448,340 for subventions for extension of Runway 28L

to 9,500 feet. Funds received during the year from the Federal Aviation Agency for construction work completed under approved grants totaled $852,000.

Property Acquisition and Sale

The following parcels of land were acquired for the expansion of the Airport during the fiscal year 1960-61:

1. 360.38-acre parcel, submerged land, purchased from Ideal Cement Company for $125,825;

2. 29.28-acre parcel, partially submerged land, purchased from Atlantic Life Insurance Company, et al., for $240,275.

The State of California, through the Department of Public Works, condemned 0.480 of an acre of Airport land for the widening of the Millbrae Avenue Interchange of the Bayshore Freeway. The City was compensated in the amount of $6,560.

Taxes

Following is a tabulation showing the total taxable land area, total assessed valuation, and total taxes paid for San Francisco International Airport property for the fiscal year 1960-61, as compared with the two previous years.

	1958-59	1959-60	1960-61
Total Taxable Area (acres)	3,345.06	4,565.06	4,954.24
Total Assessed Value	$1,164,785	$1,183,085	$1,188,590
Total Amount Taxes Paid	$ 81,268	$ 88,354	$ 89,479

IV. MUNICIPAL RAILWAY ENGINEERING AND CONSTRUCTION

General

Work continued on the design and preparation of plans and specifications for rehabilitation work on the Municipal Railway properties. In addition, plans were prepared for changes to the facilities made necessary by the Freeway construction program of the State of California.

The construction work carried on during the fiscal year was financed from the Municipal Railway Operating Fund, the Municipal Railway Reconstruction and Replacement Fund, and by the State of California.

Projects started or completed during the fiscal year are described below:

Overhead Construction

Plans and specifications for the temporary relocation of trolley coach overhead feeders and lines required for construction of a portion of the Southern Freeway at Mission Viaduct have been prepared. This work was delayed to conform to Freeway construction schedules but will be completed during the next fiscal year.

Track Paving Reconstruction

The removal of basalt paving blocks and the replacement with concrete pavement on California Street from Mason Street to Drumm Street was completed.

Buildings and Structures

The following work on buildings and structures was completed during the year:

Structural alterations and improvements and the construction of a washroom at Washington-Mason Carhouse;

Repairs and painting at the East Portal of Twin Peaks Tunnel;

Roof repairs at Eighth Avenue Substation.

Bids have been received and authorization has been given to start work early next fiscal year on the following projects:

Roof repairs at Bryant and Alameda Substation;
Roof repairs on Bay and Taylor sheave pit.

Status of Municipal Railway Construction Contracts

A summary of the Municipal Railway construction contracts in progress during the fiscal year 1960-61 is shown in Table 18.

Rapid Transit

In May, 1959, the Board of Supervisors appropriated the sum of $125,000 for the purpose of conducting a transit study in coordination with the survey to be undertaken by the Bay Area Rapid Transit District. This study was conducted under the direction of the Bureau, with assistance from the City Planning Department, Municipal Railway, Department of Public Works, and the Parking Authority. General policy guidance was provided by the Mayor's Transportation Council. The final report, "A Plan for Rapid Transit in San Francisco Consonant with the Bay Area Rapid Transit System," was transmitted to the Mayor, the Board of Supervisors, and the Mayor's Transportation Council in June, 1960.

On August 9, 1960, the Bay Area Rapid Transit District submitted a tentative plan of Rapid Transit for the five Bay Area counties to the San Francisco Board of Supervisors for preliminary consideration. The plan was considered by the County, State, and National Affairs Committee of the San Francisco Board of Supervisors at a special meeting held on November 18, 1960. Members of the Transportation Technical Committee of the Mayor's Transportation Council submitted their objections and recommendations at the meeting.

On February 9, 1961, the Bay Area Rapid Transit District submitted their tentative final plan for Rapid Transit for the five Bay counties. This plan was considered as a special order of business by the Board of Supervisors on May 22, 1961. No action was taken on the plan pending receipt of the financial report by the financial consultants of the District. This report will be submitted to the Board of Supervisors early next fiscal year.

V. STREET LIGHTING

General

The lighting of public streets within the City and County of San Francisco is provided by City-owned facilities, by facilities furnished under an annual contract with the Pacific Gas and Electric Company, and by jointly-owned facilities of the City and the Company.

During the fiscal year 1960-61 maintenance and repair of City-owned installations were performed under contract and included group lamp replacements, painting, repair of defective and damaged equipment, and miscellaneous work. Under another contract the Pacific Gas and Electric Company furnished street lighting service including maintenance of Company-owned equipment, switching and control of street lighting circuits, and emergency work as required. Electric energy for all street lighting operation within the City is supplied from the City's Hetch Hetchy power system.

Studies were continued on the planning of overall requirements for illumination of public streets. Detail planning and design for changes, improvements and additions to City-owned facilities in connection with street improvement projects were performed by the Bureau of Engineering of the Department of Public Works. Final plans are subject to approval of the Public Utilities Commission through the Bureau of Light, Heat and Power.

Operation and Maintenance

On June 30, 1961, the total number of City-owned and Company-owned street lights in service in public streets, parks, viaducts, tunnels, and underpasses was 28,915, an increase during the year of 85. Table 11 shows a summary of the number and type.

During the fiscal year 1960-61 a total of $1,022,620 was expended for the operation, maintenance and repair of the street lighting system in San Francisco, an average of approximately $34.98 per unit. Of the total expenditure, $11,144 was paid by the State from gas tax funds, which payment covered half the cost of operation and maintenance of street lighting at intersections on City streets which are part of the State highway system. A summary of expenditures for the fiscal year is shown in Table 12.

Improvements

New City-owned installations were completed during the year at a cost of $103,175 and were financed principally by the Department of Public Works under street improvement programs. A summary of these improvements is shown in Table 14.

Complaints and Damages

During the year 125 complaints and requests for service in connection with street lighting operations were investigated and acted upon. These involved

complaints of inadequate illumination, complaints of objectionable glare in windows, and requests from property owners for relocation of street lighting poles.

Also during the year there were 87 accidents involving damage to City-owned street lighting property. In each case investigation was made as soon as possible to ensure removal of hazards to the public and obstructions to traffic, and efforts were made to secure reimbursement for the cost of repairs from the party responsible for the damage. Total cost of repairs to damaged City-owned street lighting property during the year amounted to $32,629. A summary of accidents, cost of repairs, and collections is shown in Table 13.

VI. UTILITY SERVICES TO MUNICIPAL DEPARTMENTS

General

Electric energy supplied to municipal departments is generated by the City's Hetch Hetchy power system and is delivered to the various service points by means of the transmission and distribution facilities of the Pacific Gas and Electric Company under a wheeling contract. The natural gas and steam supplied to municipal departments are furnished by the Pacific Gas and Electric Company under the provisions of its contract with the Bureau.

Municipal Consumption of Electricity, Gas and Steam

During the fiscal year 1960-61 a total of 257,641,932 kilowatt-hours of electricity was supplied through 827 accounts for municipal uses, including street lighting and traffic devices. Payment for electricity by the City departments in the total amount of $2,988,621 was made through the Bureau to the Hetch Hetchy Project. At the same time a total of 13,180,984 hundred cubic-feet of natural gas was consumed through 524 accounts, and a total of 1,921,200 pounds of steam was consumed through one account, for which the Pacific Gas and Electric Company was paid a total of $752,993 and $3,873, respectively. A summary of the consumption and expenditures for these commodities supplied to each municipal department is shown in Tables 9 and 10.

San Francisco International Airport

The Bureau renders service to the San Francisco International Airport in the operation of the City-owned electric distribution system within the Airport boundary. This service includes supervising the installation and testing of the associated metering facilities, performing the necessary monthly meter readings, and preparing the corresponding billings for presentation by the Airport Department to private tenants. During the fiscal year 78 tenants were supplied a total of 50,462,671 kilowatt-hours of electricity through 145 metered and 68 unmetered accounts, for which the Airport Department collected $623,779.

TABLE 1

HETCH HETCHY WATER SUPPLY AND POWER SYSTEM

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES (INCLUDING ENCUMBRANCES)

FISCAL YEAR 1960-61

OE	Description	Budget	Actual	-Under, Over
110	Permanent Salaries	$ 377,451	$ 345,881	$ -31,570
111	Allowance for Overtime	2,208	3,122	914
112	Allowance for Holidays	8,250	6,675	-1,575
113	Extended Work Week	10,000	17,449	7,449
120	Temporary Salaries	20,081	23,882	3,801
130	Wages (Net Appropriation)	449,932	471,943	22,011
130	Wages (Gardeners)	20,045	20,042	-3
	Subtotal (Personal Services)	$887,967	$ 888,994	$1,027
200	Contractual Service	19,478	24,224	4,746
216	Maint. & Repair of Auto Equip.	32,000	31,728	-272
231.0	Heat, Light and Power	580	2,153	1,573
231.1	Purchase of Power for Resale	695,900	1,026,815	330,915
231.2	Service Charge for Transm. & Dist.	1,573,500	1,466,090	-107,410
251	Subsistence of Employees	18,000	7,670	-10,330
265	Operations Manual	-0-	20,000	20,000
269	Maintenance of Radio System	5,250	5,250	-0-
269.1	New Don Pedro Project (Prel.Engr.)	-0-	15,000	15,000
270	Bond Sale Expense	18,000	8,960	-9,040
284	Subsistence of Official Visitors	2,500	1,568	-932
295	Legislative Expense	5,000	4,059	-941
300	Material and Supplies	51,590	64,759	13,169
350	Foodstuffs	12,581	10,112	-2,469
640	Water Rights and Damage Claims	15,000	13,112	-1,888
641	Hydrography	25,565	24,938	-627
801	Accident Compensation	6,000	4,111	-1,889
804	Claims, Irrigation Districts	-0-	72,843	72,843
812	Fidelity Insurance	33	33	-0-
813	Automobile Insurance	4,060	3,448	-612
814	Fire Insurance	5,400	9,850	4,450
815	Miscellaneous Insurance	10,000	9,760	-240
854	Membership Dues	171	171	-0-
855	Fee to U.S. Gov't. - Raker Act	30,000	30,000	-0-
856	Maint. Roads & Trails - Raker Act	25,000	24,942	-58
860	Retirement Allowance	96,863	94,197	-2,666
862	Social Security	11,629	11,629	--0-
865	Health Service System	5,844	6,039	195
870	Taxes	48,000	349,381	301,381
880	Rentals - Transmission Lines	54,000	54,000	-0-
900	Services of Other Depts.	372,743	365,963	-6,780
	TOTAL OPERATION AND MAINTENANCE	$4,032,654	$ 4,651,799	$619,145
400	Equipment	11,455	12,897	1,442
756	Reconstruction and Replacement	64,650	64,650*	-0-
757	Additions and Betterments	12,500	12,500*	-0-
800	Bond Interest and Redemption	6,254,581	$ 6,131,088	-123,493
	TOTAL MISCELLANEOUS	$ 6,343,186	$ 6,221,135	$-122,051
	GRAND TOTAL	$10,375,840	$10,872,934	$ 497,094

* Unexpended balance transferred to unallocated balance of appropriation.

TABLE 2

HETCH HETCHY WATER SUPPLY AND POWER SYSTEM

SUMMARY OF RECEIPTS AND EXPENDITURES
FISCAL YEAR 1960-61

	BUDGET	ACTUAL	-UNDER OVER
RECEIPTS			
Revenue from Sale of Electric Energy	$ 6,180,000	$ 6,948,453	$ 768,453
Revenue from Sale of Water and Standby Charge, SFWD	4,500,000	4,500,000	-0-
Other Revenue	65,000	65,642	642
TOTAL GROSS REVENUE	$10,745,000	$11,514,095	$ 769,095
EXPENDITURES			
Total Expenditures (from Table 1)	$10,375,840	$10,872,934	$ 497,094
EXCESS OF REVENUE OVER EXPENDITURES	$ 369,160	$ 641,161	$ 272,001

TABLE 3
HETCH HETCHY WATER SUPPLY

PRECIPITATION, RUNOFF, STORAGE AND DELIVERY
AS OF JUNE 30 BY FISCAL YEARS

SEASON PRECIPITATION (INCHES)	Normal	1956-57	1957-58	1958-59	1959-60	1960-61
Hetch Hetchy	33.77	29.09	44.37	24.41	26.10	23.38
Lake Lloyd	-	39.98	59.02	29.77	39.32	24.47
Approx. Percent of Normal		86%	131%	72%	77%	69%
WATERSHED RUNOFF (ACRE-FT.) (a)(g)						
Hetch Hetchy	723,100	641,776	988,864	423,656	494,776	368,900 (b)
Lake Lloyd	263,300	242,037	370,010	189,230	(	(
Lake Eleanor	157,900	140,652	227,775	100,884	297,039	198,300 (b)
Total	1,144,300	1,024,465	1,586,649	713,770	791,815	567,200 (b)
Approx. Percent of Normal		90%	139%	62%	69%	50% (b)
RESERVOIR STORAGE (ACRE-FT.)	No-Spill Capacity					
Hetch Hetchy	360,360	361,746	341,606	315,258	297,730	195,572
Lake Lloyd	268,200	268,236	264,372	80,792(c)	124,868	69,973
Lake Eleanor	27,100	16,280	23,634	4,198(c)	11,414(d)	11,331 (d)
Total	655,660	646,262	629,612	400,248	434,012	276,876
DELIVERY TO SFWD (ACRE-FT.)						
Average per day		299	249	316	489	445
Maximum per day		414	420	493	502	500
Total for fiscal year		108,959	90,709	115,398	179,154	162,547 (e)(f)
Total since operation of Hetch Hetchy Aqueduct began in 1934						1,852,465 (e)

NOTES: (a) For Water Year, November 1 to October 31
(b) Estimated
(c) Drawn down to permit construction of Eleanor-Cherry Diversion Tunnel
(d) Water was diverted from Lake Eleanor to Lake Lloyd starting March 6, 1960
(e) Includes 138 acre-feet delivered to Livermore Site, U. S. Atomic Energy Commission
(f) Aqueduct was shut down October 18 to November 3, 1960, for inspection of Coast Range Tunnel
(g) One acre-foot equals 325,900 gallons or approximately 1/3 million gallons

TABLE 4

HETCH HETCHY POWER SYSTEM

ELECTRIC ENERGY, GENERATED, PURCHASED, AND DISTRIBUTED

FISCAL YEAR 1960-61

PLANT DATA	Capacity (Kilowatts) Rated	Capacity (Kilowatts) Short Time	Annual Load Factor - %
Moccasin Powerhouse	70,000	82,000	65.4
Cherry Powerhouse	135,000	140,000	-
Early Intake Powerhouse	3,600	3,900	-
Total	208,600	222,000 (a)	

ENERGY GENERATED AND PURCHASED (KILOWATT-HOURS)		
Gross Generation		
Moccasin Powerhouse	470,069,000	
Cherry Powerhouse	452,122,000 (b)	
Early Intake Powerhouse	1,759,900 (c)	923,950,900
Station Service		
Moccasin Powerhouse	768,900	
Cherry Powerhouse	942,640	
Early Intake Powerhouse	10,594	1,722,134
Net Generation		922,228,766
Purchased from P. G. & E. Co.		116,235,950
Total Available		1,038,464,716

ENERGY DISTRIBUTED (KILOWATT-HOURS)	
Project Use	3,168,162
Sales	
Municipal Accounts	257,641,932
Modesto Irrigation District	348,864,000
Turlock Irrigation District	164,960,571
Permanente Cement Company	140,764,680
Kaiser Aluminum and Chemical Corporation	13,152,000
Dow Chemical Company	44,011,368
Miscellaneous Customers	668,872
Pacific Gas and Electric Company (Dump)	1,060,607
Losses and Unaccounted For	
Hetch Hetchy System	16,378,001
P. G. & E. System (Municipal and Industrial Accounts)	47,794,523
Total	1,038,464,716

NOTES: (a) Coincidental Demand
(b) Placed on line, August 1, 1960
(c) Shut down and placed on standby status, October 24, 1960

TABLE 5
HETCH HETCHY POWER SYSTEM

COMPARATIVE ELECTRIC ENERGY CONSUMPTION BY CUSTOMERS
FISCAL YEARS 1960-61 AND 1959-60

(Nearest 100,000 Kilowatt-Hours)

CUSTOMER	1960-61	1959-60
Municipal Accounts		
Street Lighting	35,900,000	35,700,000
Public Works	18,900,000	18,000,000
S. F. International Airport	59,300,000	53,700,000
Municipal Railway	66,600,000	66,700,000
Water Department	32,900,000	37,500,000
S. F. Unified School District	16,600,000	14,900,000
Other City Departments	27,400,000	26,100,000
Modesto Irrigation District	348,900,000	300,500,000
Turlock Irrigation District	165,000,000	130,700,000
Permanente Cement Company	140,800,000	152,000,000
Kaiser Aluminum and Chemical Corp.	13,100,000	13,300,000
Dow Chemical Company	44,000,000	-
All Other Sales	700,000	4,200,000
TOTAL	970,100,000	853,300,000

TABLE 6
HETCH HETCHY POWER SYSTEM

COMPARATIVE GROSS REVENUE RECEIVED FROM SALE OF ELECTRIC ENERGY
FISCAL YEARS 1960-61 AND1959-60

(Nearest $1,000)

CUSTOMER	1960-61	1959-60
Municipal Accounts		
Street Lighting	$ 483,000	$ 480,000
Public Works	253,000	244,000
S. F. International Airport	519,000	478,000
Municipal Railway	713,000	714,000
Water Department	292,000	320,000
S. F. Unified School District	302,000	279,000
Other City Departments	427,000	408,000
Modesto Irrigation District	1,626,000	1,578,000
Turlock Irrigation District	733,000	659,000
Permanente Cement Company	1,199,000	1,290,000
Kaiser Aluminum and Chemical Corp.	86,000	84,000
Dow Chemical Company	307,000	-
All Other Sales	8,000	59,000
TOTAL	$ 6,948,000	$ 6,593,000

TABLE 7
HETCH HETCHY POWER SYSTEM

ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED BY FISCAL YEARS - KILOWATTHOURS

NET GENERATION	1955-56	1956-57	1957-58	1958-59	1959-60	1960-61
Moccasin Powerhouse	524,676,600	523,844,600	522,575,450	527,023,100	519,258,400	469,300,100
Cherry Powerhouse	-	-	-	-	-	451,179,360
Early Intake Powerhouse	25,078,500	32,497,900	32,690,647	27,876,552	17,951,026	1,749,306
Total	549,755,100	556,342,500	555,266,097	554,899,652	537,209,426	922,228,766
PURCHASE (P.G.&E. CO.)	84,435,056	139,552,972	135,797,585	202,433,126	384,528,298	116,235,950
TOTAL	634,190,156	695,895,472	691,063,682	757,332,778	921,737,724	1,038,464,716
PROJECT USE	2,938,389	3,322,249	3,439,500	3,007,776	3,246,239	3,168,162
SALES						
Municipal Accounts	214,040,036	219,993,788	220,814,868	235,557,361	252,584,748	257,641,932
Modesto Irrig. Dist.	176,712,000*	219,024,000*	179,601,000	192,134,400	300,501,600	348,864,000
Turlock Irrig. Dist.	-	-	36,621,604	66,007,346	130,742,402	164,960,571
Permanente Cement Co.	139,566,100	156,069,290	156,458,000	166,572,310	152,045,469	140,764,680
Kaiser Aluminum Corp.	14,496,000	16,128,000	14,616,000	12,000,000	13,272,000	13,152,000
Dow Chemical Company	-	-	-	-	-	44,011,368
Riverbank Ord. Plant	6,890,130	7,130,385	4,587,573	-	-	-
Miscellaneous Customers	3,319,315	633,767	2,528,934	6,585,970	4,197,071	668,872
P.G.&E. Co. (Dump)	7,111,058	-	97,296	0	0	1,060,607
LOSSES & UNACCOUNTED FOR	69,117,128	73,593,993	72,298,907	75,467,615	65,148,195	64,172,524
TOTAL	634,190,156	695,895,472	691,063,682	757,332,778	921,737,724	1,038,464,716

* Includes sales to Turlock Irrigation District

TABLE 8

BUREAU OF LIGHT, HEAT AND POWER

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES AND RECEIPTS
(INCLUDING ENCUMBRANCES)

FISCAL YEAR 1960-61

O.E.	Description	Budget	Actual	-Under Over
	EXPENDITURES			
110	Permanent Salaries	$ 86,845	$ 83,802	$ -3,043
111	Allowance for Overtime	860	219	-641
200	Contractual Services	3,455	2,534	-921
214	Alteration and Repair of Street Lighting Structures (City-owned)	10,750	1,865	-8,885
214.1	Maintenance and Repair of Street Lighting Installations (City-owned)	76,500	72,962	-3,538
231.1	Public Building Lighting	79,381	84,314	4,933
231.2	Lighting of Public Streets (Pacific Gas and Elect.Co.)	463,572	469,928	6,356
231.3	Lighting of Public Streets (Hetch Hetchy)	477,498	471,812	-5,686
231-XXX	Elect. and Gas-Interdepart.	3,173,983	3,193,895	19,912
300	Materials and Supplies	1,125	851	-274
317	Street Lighting Standards	1,000	666	-334
400	Equipment	4,000	3,276	-724
801	Accident Compensation	60	-0-	-60
804	Injuries and Damages	-0-	232	232
813	Auto Insurance	266	282	16
860	Retirement Allowance	8,872	8,749	-123
862	Social Security	1,008	1,193	185
865	Health Service System	584	604	20
		$ 4,389,759	$ 4,397,184	$ 7,425
	RECEIPTS			
	Interfund Receipts*	$ 3,199,983	$ 3,219,895	$19,912
	Ad Valorem Taxes	1,189,776	1,177,289	-12,487
		$ 4,389,759	$ 4,397,184	$ 7,425

*Transfers from other departments.

TABLE 9

BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR ELECTRICITY FOR MUNICIPAL PURPOSES

FISCAL YEAR 1960-61

DEPARTMENT	NO. OF ACCOUNTS	CONSUMPTION KILOWATT-HOURS	EXPENDITURE
Art Museum	-	465,696	$ 6,410
Child Care Centers	8	62,796	1,740
City Planning	1	84,720	1,815
DeYoung Museum	2	400,320	6,694
Disaster Corps.	2	2,363	104
Electricity	6	289,726	5,786
Employees Retirement	1	91,224	1,946
Farmers Market	1	6,032	174
Fire	62	1,462,358	35,582
Hassler Health Home	1	582,720	7,282
Health	21	4,887,690	56,364
Hetch Hetchy	7	58,968	1,986
International Airport (Incl. resale)	8	59,306,528	519,152
Legion of Honor	5	244,484	5,113
Library	28	1,675,519	30,151
Log Cabin Ranch	8	181,740	5,154
Municipal Railway	39	66,563,925	712,575
Parking Authority	1	11,760	330
Police	20	630,349	14,318
Public Buildings	9	4,254,198	50,204
Public Welfare	2	299,240	4,641
Public Works	46	18,876,236	247,519
Purchasing	6	220,478	3,929
Real Estate - Auditorium	3	1,249,896	18,542
Real Estate - temporary services	7	430	17
Recreation and Park	177	6,823,496	122,221
S. F. Unified School District	249	16,612,264	301,867
Sheriff	2	862,400	9,683
Street Lighting Operations	-	35,907,471	471,812
War Memorial - General	2	769,504	11,623
Water	94	32,966,988	292,117
Youth Guidance	1	987,600	11,708
TOTAL MUNICIPAL DEPARTMENTS	819	256,839,119	$ 2,958,559
Academy of Sciences	6	802,813	13,082
State of Calif: Street Lighting	1	(a)	11,144
Traffic Devices	1	(b)	5,836
GRAND TOTAL	827	257,641,932	$ 2,988,621

NOTES: (a) Included under Street Lighting Operations
(b) Included under Public Works

TABLE 10
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR GAS AND STEAM FOR MUNICIPAL PURPOSES
FISCAL YEAR 1960-61

NATURAL GAS

DEPARTMENT	NO. OF ACCOUNTS	CONSUMPTION HUNDRED CU. FT.	EXPENDITURE
Child Care Centers	8	21,276	$ 1,447
City Planning	1	5,070	333
DeYoung Museum	2	60,538	3,514
Disaster Corps	1	472	41
Electricity	3	10,734	715
Farmers Market	1	588	49
Fire	81	595,525	37,461
Hassler Health Home	2	278,856	18,309
Health	19	3,840,265	184,998
Hetch Hetchy	2	1,946	168
International Airport	13	668,428	35,638
Library	26	91,577	6,101
Municipal Railway	12	254,640	16,229
Parking Authority	1	2,674	182
Police	13	73,849	5,460
Public Buildings	3	648,634	34,110
Public Works	11	409,573	28,216
Purchasing	3	47,457	2,892
Real Estate - Auditorium	2	1,378	110
Real Estate - Temporary Services	2	152	15
Recreation and Park	98	1,095,717	69,297
Registrar of Voters	1	13,880	968
San Francisco Unified School Dist.	193	3,726,863	230,640
Sheriff	3	404,575	21,342
Single Men's Rehabilitation Center	1	39,436	2,635
War Memorial - General	3	193,062	12,730
Water	15	67,714	4,640
Youth Guidance	2	411,500	21,813
TOTAL MUNICIPAL DEPARTMENTS	522	12,966,379	$ 740,053
Academy of Sciences	1	150,515	9,427
New Hall of Justice (Contractor)	1	64,090	3,513
GRAND TOTAL	524	13,180,984	$ 752,993

STEAM
(Does not include steam generated by City)

DEPARTMENT	NO. OF ACCOUNTS	CONSUMPTION POUNDS	EXPENDITURE
Public Welfare	1	1,921,200	$ 3,873

TABLE 11
BUREAU OF LIGHT, HEAT AND POWER

STREET LIGHTS IN SERVICE
JUNE 30, 1961

UNDERGROUND CONNECTED	Company-Owned	Jointly-Owned	City-Owned	Total
High voltage series circuit				
1,000 Lumen Incandescent	--	22	--	22
2,500 " "	331	307	464	1,102
4,000 " "	2,491	549	2,742	5,782
6,000 " "	794	643	4,749	6,186
10,000 " "	989	45	521	1,555
20,000 " Fluorescent	5	--	25	30
400 Watt Mercury vapor	16	--	47	63
1,000 Watt Mercury vapor	--	--	3	3
Low voltage multiple circuit				
1,000 Lumen Incandescent	--	--	171	171
2,500 " "	8	--	11	19
4,000 " "	175	1	19	195
6,000 " "	81	9	52	142
10,000 " "	--	--	8	8
20,000 " Fluorescent	36	--	98	134
400 Watt Mercury Vapor	108	--	30	138
OVERHEAD CONNECTED				
High voltage series circuit				
2,500 Lumen Incandescent	289	--	--	289
4,000 " "	12,540	--	31	12,571
6,000 " "	209	--	--	209
Low voltage multiple circuit				
2,500 Lumen Incandescent	13	--	--	13
4,000 " "	152	--	--	152
6,000 " "	131	--	--	131
TOTAL AS OF JUNE 30, 1961	18,368	1,576	8,971	28,915
	63.9%	5.5%	31.0%	100%
Total as of June 30, 1960	18,407	1,593	8,830	28,830
Net change during the year	-39	-17	+141	+85

TABLE 12
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURES FOR OPERATION AND MAINTENANCE OF STREET LIGHTING
FISCAL YEAR 1960-61

CONTRACTUAL SERVICE (P. G. & E. COMPANY)			
Company-owned facilities (a)	$701,215		
Jointly-owned facilities (a)	66,597		
City-owned facilities (b)	185,075		
Emergency service to City-owned facilities	1,830	$954,717	
Less deduction for energy		482,955	$471,762
CONTRACTUAL SERVICE (ELECT. MAINT. & SERVICE CO.)			
Maintenance of City-owned facilities			
Group replacement of lamps	28,531		
Routine maintenance	4,389	32,920	
Repair of City-owned facilities			
Damages from equipment failure	4,910		
Accident damages (c)	30,072	34,982	67,902
ELECTRIC ENERGY (HETCH HETCHY)			
35,907,471 Kilowatt-hours @ $0.01345			482,956
TOTAL EXPENDITURE			$ 1,022,620
LESS: Amount paid to Hetch Hetchy from Gas Tax for State Highway routes			11,144
TOTAL NET EXPENDITURE			$ 1,011,476

AVERAGE OPERATING COST

Based on total number of street lights in service, June 30, 1961, average cost of operation and maintenance for the fiscal year:

Per light per night	$ 34.98

NOTES: (a) Includes maintenance, repair, and fixed charges of Company-owned facilities, and electric energy.

(b) Includes replacement of individual lamps and broken glassware, service and switching charges, and electric energy.

(c) Where responsible party is known, claim is filed for recovery of costs.

TABLE 13
BUREAU OF LIGHT, HEAT AND POWER

ACCIDENT DAMAGE TO CITY-OWNED STREET LIGHTING
BY FISCAL YEARS

	1958-59	1959-60	1960-61
Number of Accidents	49	53	87
Cost of Damage Repairs (a)	$ 21,265	$ 24,556	$ 32,629 (b)
Average Cost Per Accident	434	454	375
Amount Billed Responsible Parties (c)	7,832	23,156	21,683
Amount Collected:			
By Bur. Light, Heat and Power	3,800	10,600	7,852
By Bur. Delinquent Revenue (d)(e)	2,131	3,929	2,663
Amount Abandoned (Uncollectible)	1,525	3,626	3,646
Balance Receivable June 30:			
Payable to Bur. Light, Heat and Power	3,064	6,036	1,803
Payable to Bur. Delinquent Revenue (e)	9,793	12,478	19,706

NOTES: (a) Includes administrative expense
(b) Includes estimated cost of uncompleted work as of June 30, 1961.
(c) Includes only cases of current and previous year for which work was completed during the year.
(d) Includes installment payments on cases from previous years.
(e) Accounts are transferred to Bureau of Delinquent Revenue when:
1. Account is over 90 days old
2. Installment payments are made
3. Liability is denied
4. Responsible party is deceased or his whereabouts unknown

TABLE 14
BUREAU OF LIGHT, HEAT AND POWER

NEW CITY-OWNED STREET LIGHTING INSTALLATIONS
COMPLETED DURING FISCAL YEAR 1960-61

Location	No. of Lights	Type of Light(a)	Source of Funds (b)	Value
Brotherhood Way - Lake Merced Blvd. to Thomas More Way	2	Inc.	DPW	$ 2,179
Bush Street at Stockton Street	2	Inc.	DPW	638
Candlestick Park Bus Loading Zone	7	Inc.	DPW	6,631
Forest Knolls Tract	18	Inc.	P O	14,566
Glendale Stairway at Cortland Ave.	2	Inc.	DPW	1,884
Adjacent to New Hall of Justice (Bryant, Harriet, and 7th Streets)	11	MV	DPW	10,850
Jefferson St. - Powell to Leavenworth	16	Inc.	DPW	12,163
Mansell St. - San Bruno to University	40	Inc.	DPW	23,125
Mission Street at Army Street	2	MV	DPW	295
San Bruno Av - Silver to Rickard; Rickard St. - San Bruno to Barneveld	10	Inc.	DPW	7,461
South Van Ness Ave. at Market Street; 11th Street at Market Street	5	MV	P O	4,670
13th Street - Mission Street to South Van Ness Avenue	20	Fluor.	DPW	16,848
Extension to Municipal Railway Trolley Poles for Mercury Street Lights	-	-	BLHP	1,865
TOTAL	135			$ 103,175

NOTES: (a) Inc. - Incandescent lamp
MV - Mercury Vapor lamp
Fluor - Fluorescent lamp

(b) BLHP - Bureau of Light, Heat and Power
DPW - Department of Public Works
PO - Property Owner

TABLE 15

BUREAU OF LIGHT, HEAT AND POWER

HISTORICAL COST OF CITY-OWNED STREET LIGHTING IMPROVEMENTS

		City Funds				Housing	Federal	State	Property	
		P. U. C.	D. P. W.	Park	Mun. Ry.	Auth.	Funds	Funds	Owners	Total
Prior to July 1,	1940	$ 366,959	$ 418,361	$ -	$ -	$ -	$336,070	$ -	$123,856	$1,245,246
Fiscal Year	1940-41	5,380	10,910	-	-	-	45,376	-	40,827	102,493
	1941-42	1,980	2,445	-	-	-	13,720	-	32,800	50,945
	1942-43	3,969	8,345	-	-	-	-	-	3,718	16,032
	1943-44	470	4,902	-	-	-	-	-	371	5,743
	1944-45	450	-	-	-	-	-	-	5,738	6,188
	1945-46	298	-	1,166	-	-	-	-	350	1,814
	1946-47	4,357	-	-	-	-	-	-	-	4,357
	1947-48	112,615	76,768	14,295	1,110	-	-	-	112,847	317,635
	1948-49	257,652	9,043	-	-	-	-	-	22,987	289,682
	1949-50	303,629	27,194	6,350	-	-	-	-	12,394	349,567
	1950-51	155,842	101,576	-	-	-	-	-	165,043	422,461
	1951-52	27,154	47,698	-	5,806	-	-	22,650	23,695	127,003
	1952-53	251,090	219,956	-	505	-	-	-	31,778	503,329
	1953-54	142,151	22,181	-	-	1,239	-	2,274	23,495	191,340
	1954-55	115,727	30,817	-	-	543	-	16,578	748	164,413
	1955-56	15,704	48,620	-	-	1,360	-	19,181	2,484	87,349
	1956-57	114,168	26,641	-	-	3,003	-	-	7,256	151,068
	1957-58	2,501	64,942	-	-	-	-	4,142	18,199	89,784
	1958-59	-	171,367	-	538	-	-	626	10,231	182,762
	1959-60	-	100,126	3,861	222	-	-	10,242	35,874	150,325
	1960-61	-	82,074	-	1,865	-	-	-	19,236	103,175
Total: June 30, 1961		$1,882,096	$1,473,966	$25,672	$10,046	$6,145	$395,166	$75,693	$693,927	$4,562,711

Less: Cost of portions removed $ 4,350

Original cost of City-owned facilities in service: June 30, 1961 $4,558,361

TABLE 16
HETCH HETCHY WATER SUPPLY & POWER SYSTEM

CONSTRUCTION CONTRACTS
FISCAL YEAR 1960-61

Contract No.	Description	Contractor	Contract Time Started	Contract Time Completed	Original Contract Price	Value of Work Done During Fiscal Year
HH-289	Furnish and Install Generators, Cherry Powerhouse	Allis Chalmers Mfg.Co.	7-15-57	--	$3,169,520(a)	$186,214
HH-316	Construct Cherry Powerhouse (Includes Installing Items 1 2 and part of 4 below)	Gunther & Shirley E. V. Lane Co. Harms & Thomas	10-13-58	10-19-60	5,230,175	850,791
HH-329	Construct Warnerville Substation (Includes Installation of Item 3 and part of Item 4 below.)	Stolte, Inc.	6-29-59	10-21-60	887,916	133,712
HH-333	Reconstruct & Surface Road Jones Point to Mather	D. E. Woof	5-16-60	8-13-60	86,535	14,064
HH-334	Alterations to Moccasin Sewer System	Roy Madsen Const. Co.	6-20-60	9-17-60	27,794	19,358
HH-335	Reroof Six Cottages, Moccasin	W. E. Wickliffe	9-19-60	11-17-60	7,965	7,965
HH-337	Exploratory Core Drilling for Canyon Project	Boyles Bros.	12-26-60	3-17-61	18,930	16,642
HH-338	Addition to Cottage No. 1, O'Shaughnessy Dam	W. Wolverton	4-17-61	6-2-61	5,100	5,100
HH-339	Electric Metering Facilities Modesto Substation J (Includes Installation of Item 5 below)	Modesto Industrial Electrical Co., Inc.	4-17-61	6-14-61	5,443	5,443
HH-340	Installation of Chlorination Equipment, Tesla Portal	Wallace & Tiernan, Inc.	2-27-61	3-8-61	2,025	2,025
HH-342	Seal Coat, Mather Road	J. H. Harrison	6-12-61	6-20-61	16,030	17,630

(Cont'd)

TABLE 16 - (Cont'd)
HETCH HETCHY WATER SUPPLY & POWER SYSTEM

CONSTRUCTION CONTRACTS
FISCAL YEAR 1960-61

Item No.	Purchase Order No.	Description	Contractor	Contract Time Started	Contract Time Completed	Original Contract Price	Value of Work Done During Fiscal Year
(1)	61996	Furnish & Deliver Hydraulic Turbines, Governors, Valves, etc., Cherry Powerhouse	Pelton Division Baldwin-Lima-Hamilton	10-15-57	10-17-60	$2,429,418(b)	$209,511
(2)	3084	Power Transformers for Cherry Powerhouse	Allis Chalmers Mfg. Co.	1-14-59	7-1-60	930,208(c)	70,665
(3)	3085	Power Transformers for Warnerville Substation	Allis Chalmers Mfg. Co.	1-14-59	8-8-60	762,439(c)	134,993
(4)	13494	Oil Circuit Breakers for Warnerville Substation & Intake Switchyard	Federal-Pacific Electric Company	5-1-59	10-11-60	1,118,731	599,926
(5)	R74845	Current Transformers for Modesto Substation J	Allis Chalmers Mfg. Co.	2-28-61	5-6-61	26,957	26,698
		Total Amount of Hetch Hetchy Contract Construction Work Performed During Fiscal Year					$2,300,737

(a) Includes 25% Reserve for Escalation
(b) Includes 20% Reserve for Escalation
(c) Includes 10% Reserve for Escalation

TABLE 17
SAN FRANCISCO INTERNATIONAL AIRPORT

CONSTRUCTION CONTRACTS
FISCAL YEAR 1960-61

Contract No.	Description	Contractor	Contract Time Started	Contract Time Completed	Original Contract Price	Value of Work Done During Fiscal Year
A-235	Apron Extension Paving and Utilities	Chas. L. Harney, Inc.	10-5-59	7-5-60	$194,420	$ 3,038
A-246	Remodel Ground Floor, Pier D	Martinelli Const. Co.	7-11-60	10-21-60	69,340	69,477
A-247	Improvement to Piers & North Concourse	Barrett Const. Co.	10-17-60	3-8-61	92,500	92,500
A-248	Paving, Utilities & Landscaping Main Entrance Road Area	Lowrie Paving Co.	4-11-60	7-19-60	102,564	24,097
A-249	Remodel 4th Floor, Terminal Building	McBroom & Cecchini	6-11-60	12-7-60	59,300	59,716
A-250	Utilities Extension Roads R-3 and R-6	McGuire and Hester	6-27-60	10-19-60	220,780	212,124
A-253	Additions to Sewage Treatment Plant	Oscar C. Holmes	8-15-60	3-31-61	144,142	148,638
A-255	Additions to Toilets & Waiting Rooms, Terminal Building	Martinelli Const. Co.	2-29-60	12-22-60	211,880	145,572
A-257	South Baggage Conveyor	Standard Conveyor Co.	5-16-60	9-9-60	38,573	38,573

(Cont'd)

TABLE 17 - (Cont'd)
SAN FRANCISCO INTERNATIONAL AIRPORT

CONSTRUCTION CONTRACTS
FISCAL YEAR 1960-61

Contract No.	Description	Contractor	Contract Time Started	Contract Time Completed	Original Contract Price	Value of Work Done During Fiscal Year
A-262	Fill for Extension of Runway 19L & Maint. Base Area	Ratkovich Const. Co.	7-4-60	--	$1,341,525	$ 1,331,676
A-263	Pavement for Extension of Runway 1R-19L	O. C. Jones	6-12-61	--	176,841	6,079
A-265	Pavement Reconstruction & Runway Extension	L. C. Smith Co.	8-15-60	12-9-60	555,043	488,265
A-270	Concrete Roof for Water Tank	Hart & Hynding, Inc.	6-19-61	--	8,373	--
A-271	Pavements for Roads R-3 and R-18	L. C. Smith Co.	9-28-59	7-1-60	73,054	652
A-274	Lighting Runway 1R Ext.	Dahl-Beck Electric Co.	4-18-60	8-23-60	67,353	69,993
A-278	Reconstruct. Runway Lighting System	Safe Electric Co.	10-10-60	--	159,478	135,525
A-279	Ticket Counters, Office & Baggage Area, Term'l Bldg.	McBroom & Cecchini	4-11-60	9-9-60	74,308	38,545
A-282	Construct Temporary Parking Area "A"	Lowrie Paving Co.	9-5-60	12-9-60	55,988	59,947
A-283	Pier D Floor Covering	Peterson-Cobby Co.	10-10-60	12-8-60	16,463	16,463

(Cont'd)

TABLE 17 - (Cont'd)
SAN FRANCISCO INTERNATIONAL AIRPORT

CONSTRUCTION CONTRACTS
FISCAL YEAR 1960-61

Contract No.	Description	Contractor	Contract Time Started	Contract Time Completed	Original Contract Price	Value of Work Done During Fiscal Year
A-284	Fill for Extension of Runway 28L	Chas. L. Harney	2-27-61	--	$1,779,685	$ 415,339
A-287	Silt Removal	F. F. & M. Co., Inc.	10-31-60	12-7-60	4,618	4,307
A-289	Utilities Relocation South Terminal Area	Great Western Pipe-line Co., Inc.	5-8-61	--	34,729	34,457
A-291	Alterations to Offices, Pier D	Martinelli Const. Co.	1-16-61	2-24-61	1,631	1,631
A-293	Alterations to Sixth Floor Heating	Electrical Maint. & Service Co.	12-19-60	1-31-61	937	987
A-295	Relocation of Steam & Electric Service, South Terminal Area	Stenmark Const. Co.	4-24-61	--	90,999	76,424
A-296	Piling and Demolition South Terminal Bldg.	Raymond Concrete Pile Division	6-26-61	--	494,745	--
	Total Amount of Airport Contract Construction Work Performed During Fiscal Year					$3,474,025

TABLE 18
MUNICIPAL RAILWAY

CONSTRUCTION CONTRACTS
FISCAL YEAR 1960-61

Contract No.	Description	Contractor	Contract Time Started	Contract Time Completed	Original Contract Price	Value of Work Done During Fiscal Year
MR-444	Alterations to Washington and Mason Carhouse	McCormick Builders	8-22-60	1-4-61	$60,300*	$62,300
MR-466	Remove Basalt Block Paving & Repave, California Street, Mason St. to Drumm St.	Pacific Pavements	8-8-60	9-12-60	19,665	18,783
MR-467	Repairs & Painting, East Portal, Twin Peaks Tunnel	Phoenix Painting Co.	6-6-60	8-4-60	6,740	6,740
MR-470	Roof Repair, Eighth Ave. Substation	Regal Roofing Co.	5-22-61	6-15-61	657	657
MR-471	Washroom, Washington & Mason Carhouse	Robert L. Sage	4-17-61	6-5-61	1,501	1,501
Total Amount of Municipal Railway Contract Construction Work Performed During Fiscal Year						$89,981

*Includes City-furnished materials